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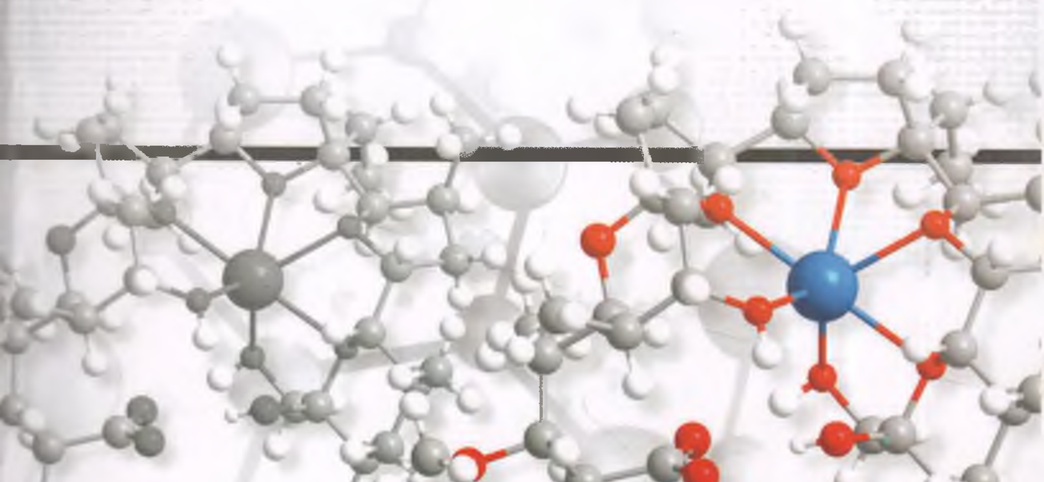
ORGANIK KIMYO
ORGANIK BIRIKMALARNI NOMLASH



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KIMYO FAKULTETI

H.S.Tojimuhamedov, T.S.Xoliqov,
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Universitet talabalari uchun o‘quv qo‘llanma

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ANNOTATSIYA

O'quv qo'llanmada organik birikmalarni IUPAC qoidalariga muvofiq zamonaviy nomlashga doir materiallar berilgan. IUPAC nomenklaturasi tarkibiga kiruvchi tarixiy, ratsional, o'rinbosarli, additiv, subtraktiv, "a" nomenklatura qoidalari misollar bilan tushuntirilgan. Kraun efirlari, ba'zi tabiiy birikmalar, dorivor preparatlar, pestisidlar va ularning hosilalarini nomlash to'g'risida ham ma'lumotlar berilgan.

O'quv qo'llanma universitet talabalariga mo'ljallangan. Undan o'rta maktab, akademik lisey, kasb-hunar kollejlarining yuqori sinf o'quvchilari, yosh o'qituvchilar ham foydalanishlari mumkin.

В учебном пособии даны материалы, связанные с современной номенклатурой органических соединений в согласии с правилами IUPAC. Правила тривиальной, рациональной, заместительной, аддитивной, субтрактивной, "а" номенклатур, входящие в состав номенклатуры IUPAC подробно объяснены на примерах. Даны сведения по номенклатуре краун эфиров, некоторых природных соединений, лекарственных препаратов, пестицидов и их производных.

Учебное пособие предназначено студентам университетов. Им могут пользоваться также ученики старших классов средних школ, академических лицеев, профессиональных колледжей и молодые преподаватели.

The training manual provides materials related to the modern nomenclature of organic compounds in accordance with the rules of IUPAC. The rules of trivial, rational, substitutive, additive, subtractive, "a" nomenclature included in the IUPAC nomenclature are explained in detail by examples. Information on the nomenclature of crown esters, some natural compounds, drugs, pesticides and their derivatives is given.

The training manual is intended for University studens. It can also be used by studens of senior secondary schools, academic lyceums, professional colleges and young teachers.

Kirish

Bugungi kunda oliy ta'lim muassasalarida o'quv-tarbiyaviy jarayonlarni yuqori ilmiy-metodik, ma'naviy-ma'rifiy darajada olib borish, talabalarni fanning oxirgi yutuqlari doirasida o'rgatib borish dolzarb vazifalardan xisoblanadi.

O'zbekiston Respublikasi Prezidentining "Oliy ta'lim tizimini yanada rivojlantirish chora-tadbirlari to'g'isida"gi 2017-yil 20-apreldagi PQ-2909-, "Mirzo Ulug'bek nomidagi O'zbekiston Milliy Universitetida talab yuqori bo'lgan malakali kadrlar tayyorlash tizimini tubdan takomillashtirish va ilmiy salohiyatini rivojlantirish chora-tadbirlari to'g'risida"gi 2019-yil 17-iyundagi PQ-4358- va "Kimyo va biologiya yo'nalishlarida uzluksiz ta'lim sifatini va ilm-fan natijadorligini oshirish chora-tadbirlari to'g'risida"gi 2020-yil 12-avgustdagi PQ-4805 qarorlaridagi ustuvor yo'nalishlar mazmunidan kelib chiqqan holda darsliklar va o'quv qo'llanmalar tayyorlash muhim ahamiyat kasb etadi.

Shu munosabat bilan universitetlarda kimyo fanidan, shu jumladan organik kimyo fanidan zamonaviy o'quv adabiyotlarini tayyorlash dolzarbdir. Organik kimyo fanini chuqur o'rganishda organik birikmalarni zamonaviy qoidalar asosida nomlash katta ahamiyatga egadir.

Kimyoviy birikmalarni nomlash kimyoviy til bo'lib, uning odatdagi tillardan asosiy farqi ham shu nomlashdir. Kimyoviy tilning yana bir o'ziga xos tomoni, uning yozma shaklining og'zaki shakliga nisbatan juda muhim ekanligidir. Kimyoviy birikmalarni hozirgi vaqtdagi sistematik nomlashning asosiy maqsadi bu nomlash orqali kimyoviy birikmaning tarkibini va iloji boricha uning tuzilishini bayon qilishdir. Kimyoviy birikmalarning IUPAC nomenklaturasi deb ataladigan hozirgi zamon nomlanishi ularning eski, yangi va turli nomenklaturalarining majmuasidan iboratdir. Ularni turli usullar bilan, ayniqsa sistematik usul bilan nomlash o'quvchidan ma'lum bilimni talab qiladi. Shuning uchun har bir kimyogar kimyoviy birikmalarni zamonaviy nomlashni o'rganishi va bilishi zarur.

Tajriba shuni ko'rsatadiki, turli mutaxassislikdagi kimyogarlarning ko'pchiligi organik birikmalarni nomlashda kamchiliklarga yo'l

qo'yadilar. Organik kimyo bo'yicha o'zbek tilida chiqarilgan darsliklar va o'quv qo'llanmalarda bu masala yetarli darajada to'liq yoritilmagan.

Mazkur o'quv qo'llanma shu kamchiliklarni bartaraf qiladi va o'quvchilarga organik kimyo fanini o'rganishga yordam beradi degan umiddamiz.

O'quv qo'llanmani yanada takomillashtirish bo'yicha bildiriladigan takliflarni minnatdorlik bilan qabul qilinadi.

I. ORGANIK BIRIKMALARNI NOMLASH TURLARI

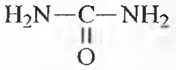
Organik birikmalarni nomlashning IYuPAK (IUPAC) nomeklaturasi tarkibiga kiruvchi turlari quyidagilardan iborat:

- Tarixiy yoki trivial nomenklatura;
- Ratsional nomenklatura;
- O'rinbosarli nomenklatura;
- Additiv nomenklatura;
- Subtraktiv nomenklatura;
- "a" nomenklatura;
- Boshqa nomenklaturalar.

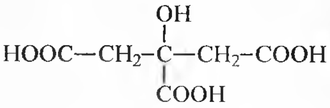
I.1. Tarixiy yoki trivial nomenklatura

Organik kimyo fani rivojlanishining tarixiy yo'lini aks ettiruvchi bu nomeklatura moddalarning olingan tabiiy manbai, o'ziga xos xususiyatlari, olinish usullari, birinchi marta olgan va xossalarini o'rgangan olimning nomi bilan bog'liq bo'lgan nomeklaturadir. Quyida keltirilgan moddalarning nomlari shu xususiyatlarni aks ettiradi.

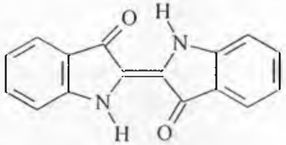
Tabiiy manbalardan olinganlar: HCOOH – chumoli kislota,



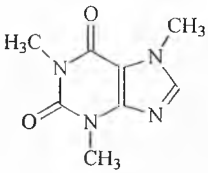
mochevina



limon kislota

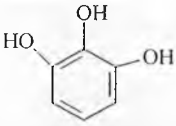


indigo

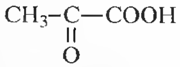


kofein

Olinish usuliga ko'ra:

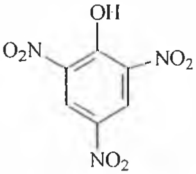


pirogallol



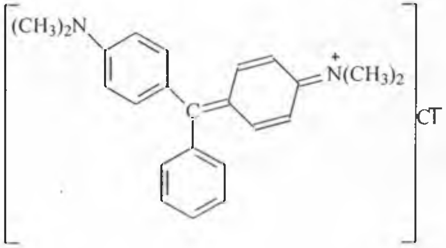
pirouzum kislota

O‘ziga xos xususiyatli:



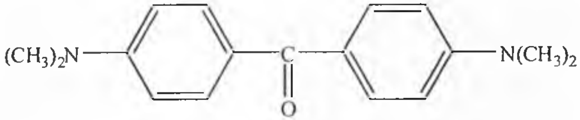
$CH_3(CH_2)_4COOH$

pikrin kislota   kapron kislota



malaxit yashili

Xossalarini o‘rgangan olimning nomi: C_2H_5MgCl Grin`yar reaktivi,



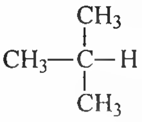
Mixler ketoni va x.k.

I.2. Ratsional nomenklatura

Bu nomenklatura IUPAC nomenklatura majmuasida *radikal-funksional* nomenklatura deb xam ataladi.

Organik birikmalarni ratsional nomenklaturada nomlashda bu birikma *gomologik qatorining eng sodda vakillarining* yoki *uglevodorod qoldig‘ining nomi* asos qilib olinadi. Ularning H atomini radikallarga almashingan hosilasi deb qaraladi. H atomiga almashgan radikallarning sonini di-, tri-, tetra- va x.k. deb belgilanadi.

Masalan: trimetilmetan (metanning nomi asosidagi nomenklatura)



CH_4 metan molekulasidagi 3 ta vodorod atomi 3 ta metil guruhga almashgan.

Radikal-funksional nomenklaturada nomlashda o'sha funksional guruxga, sinfga xos nom va radikal nomi keltiriladi.

Masalan: ikkilamchi butil spirt

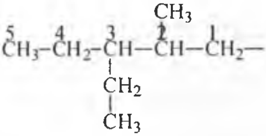
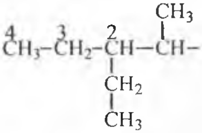
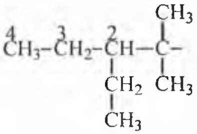
$$CH_3-CH_2-\underset{CH_3}{\underset{|}{CH}}-OH$$

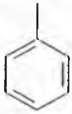
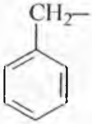
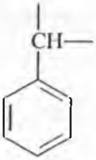
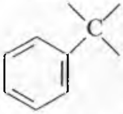
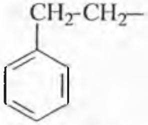
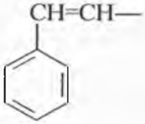
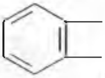
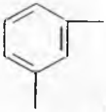
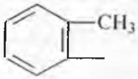
Ratsional nomenklatura bo'yicha organik birikmalarni nomlashda uglevodorodlar qoldiqlarining quyidagi nomlaridan foydalaniladi.

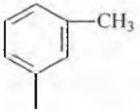
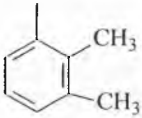
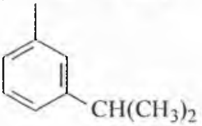
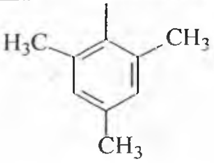
1 – jadval

Uglevodorod qoldiqlarining nomlari

CH_3-	Metil
CH_3-CH_2-	Etil
$CH_3-CH_2-CH_2-$	Propil
$CH_3-\underset{CH_3}{\underset{\vert}{CH}}-$	Izopropil, Ikkilamchi propil
$CH_3-CH_2-CH_2-CH_2-$	n-butil-, birlamchi butil
$CH_3-CH_2-\underset{CH_3}{\underset{\vert}{CH}}-$	Ikkilamchi butil
$CH_3-\overset{CH_3}{\overset{\vert}{\underset{CH_3}{\underset{\vert}{C}}}}-$	Uchlamchi butil
$CH_3-\underset{CH_3}{\underset{\vert}{CH}}-CH_2-$	Izobutil
$CH_3-\underset{CH_3}{\underset{\vert}{CH}}-CH_2-CH_2-$	Izoamil
$CH_3-\overset{CH_3}{\overset{\vert}{\underset{CH_3}{\underset{\vert}{C}}}}-CH_2-$	Neopentil
$\overset{5}{C}H_3-\overset{4}{C}H_2-\overset{CH_3}{\overset{\vert}{\overset{3}{C}}}H-\underset{CH_3}{\underset{\vert}{\underset{CH_2}{\underset{\vert}{\overset{2}{C}}}}}H-\overset{1}{C}H_2-$	2-etil-3-metilpentil

	3-etil-2-metilpentil
	2-etil-1-metilbutil
	2-etil-1,1-dimetilbutil
$CH_2=CH-$	Vinil, etenil
$CH_3-CH=CH-$	Propen-1-il-1
$CH_2=CH-CH_2-$	Allil, propen-2-il-1
$CH_2=\underset{\mid}{C}-CH_3$	Izopropenil, propen-1-il-2, 1-metilvinil
$CH_2=CH-\underset{\mid}{C}H-CH_3$	Buten-1-il-3, metilallil
$CH\equiv C-$	Etinil
$CH\equiv C-CH_2-$	Propin-2-il-1, propargil
$-\overset{\mid}{\underset{\mid}{C}}H$	Metilidin
$-CH_2-$	Metilen
$CH_3-\underset{\mid}{C}H-$, $CH_3-CH=$	Etiliden
$H_3C-\overset{\mid}{\underset{\mid}{C}}-$	Etilidin
$-CH_2-CH_2-$	Etilen
$-CH_2-CH_2-CH_2-$	Trimetilen
$-(CH_2)_5-$	Pentametilen
$H_3C-\underset{\mid}{C}H-\underset{\mid}{C}H_2$	Propilen

$CH_3-\underset{\|}{\underset{\|}{C}}-CH_3$	Izopropiliden
$H_2C=\overset{\|}{C}-$	Viniliden
	Fenil
	Benzil
	Benzal (benziliden)
	Benzilidin
	Fenetil
	Stiril
 $o-C_6H_4-$	o-Fenilen 1,2-fenilen
 $m-C_6H_4-$	m-Fenilen 1,3-fenilen
	o-Tolil 2-tolil

	m-Tolil
	2,3-ksilil
	3-kumenil m-kumenil
	Mezitil
$(C_3H_5\text{-})$	Siklopropil

Organik birikma molekulasi molekulyar massasining ortishi va tuzilishining murakkablashishi bilan ularni tarixiy yoki ratsional nomenklatura bo‘yicha nomlash qiyinlashadi yoki mumkin bo‘lmay qoladi. Bu vaqtda o‘rinbosarli (yoki sistematik, ilmiy) nomenklatura yordamga keladi.

I.3. O‘rinbosarli nomenklatura

Bu nomenklatura *ilmiy* yoki *sistematik* nomenklatura deb xam ataladi. Ilmiy nomenklaturaga 1892-yilda Jenevada kimyogarlarning xalqaro kongressida asos solingan. Jeneva nomenklaturasi deb nom olgan bu nomenklatura o‘rinbosarli nomenklaturaning birinchi varianti bo‘lib hisoblanadi. Kimyogarlarning Lej shaxrida 1930 yilda bo‘lib o‘tgan kongressida o‘rinbosarli nomenklatura masalalari yanada takomillashtirildi va u nomenklatura Lej nomenklaturasi deb ham ataldi. Urushdan keyingi yillarda o‘rinbosarli nomenklatura “Nazariy va amaliy kimyoning xalqaro ittifoqi” (qisqacha IUPAC) deb nomlangan tashkilotning nomenklatura masalalari bilan shug‘ullanuvchi maxsus komissiyasi tomonidan rivojlantirildi. Bu komissiya tomonidan

tayyorlangan nomenklaturaning IUPAC qoidalari 500 betli kitob bo‘lib, u 1979 yilda nashr qilingan, 1993 yilda esa qoidalarni aniqlashtiruvchi va to‘ldiruvchi tavsiyalar e’lon qilingan. Bu qoidalar asosidagi IYuPAK nomenklaturasi hozirda qo‘llaniladigan barcha turdagi nomenklaturalarning majmuasidir.

Ochiq uglerod zanjirli birikmalarning zamonaviy o‘rinbosarli nomenklaturasi asosida normal (tarmoqlanmagan) uglerod zanjirining nomlari yotadi. Uglerod atomlarining soniga qarab bu zanjirlar quyidagicha nomlanadi:

met-bitta uglerod atomi
et-ikkita uglerod atomi
prop-uchta uglerod atomi
but-to‘rtta uglerod atomi
pent-beshta uglerod atomi

geks-, **gept**-, **okt**-, **non**-, **dek**- va x.k.lar grek va lotin sonlari o‘zaklaridan olingan so‘zlar mos ravishda oltita, ettita, sakkizta, to‘qqizta, o‘nta uglerod atomlarini bildiradi.

Xalqasimon tuzilishli birikmalarning nomlari asosida siklogeksan, benzol, naftalin, piridin, indol, furan kabi ko‘plab tarixiy nomlar yotadi. Organik modda tuzilishining qolgan barcha o‘ziga xos tomonlari modda nomi asosida *qo‘shimcha* (suffiks) yoki *old qo‘shimcha* (prefiks) qo‘shish bilan xosil qilinadi.

2-jadval

Organik kimyoda qo‘llaniladigan sonli old qo‘shimchalar (prefikslar)

Ko‘paytiruvchi omil	Prefiks	Ko‘paytiruvchi omil	Prefiks
1	Mono	21	Geneykoza
2	Di	22	Dokoza
3	Tri	23	Trikoza
4	Tetra	24	Tetrakoza
5	Penta	...	...
6	Geksa	30	Triakonta
7	Gepta	31	Gentriakonta
8	Okta	32	Dotriakonta
9	Nona	...	...
10	Deka	40	Tetrakonta
11	Undeka	...	...

12	Dodeka	100	Gekta
13	Trideka	...	...
...	...	132	Dotriakonta-gekta
20	Eykoza		

Uglerod zanjirining to'yinganlik yoki to'yinmaganlik darajasi -**an**, -**en** va -**in** qo'shimchalar qo'shish bilan ko'rsatiladi.

Birikma tarkibidagi funksional guruhlar maxsus qo'shimchalar bilan ifodalanadi. Masalan spirtlar –**ol** qo'shimchasi bilan, aldegidlar –**al**, ketonlar –**on**, aminobirikmalar –**amin**, karbon kislotalar **kislota** qo'shimchalari bilan ko'rsatiladi. Agar bu funksional guruhlarni nomning boshida yoki o'rtasida berish kerak bo'lsa ular **gidroksi**–, **okso**–, **amino**–, **karboksi**–, kabi old qo'shimchalar bilan ifodalanadi.

Birikma tarkibida funksional guruhlar ko'p bo'lsa, ularning bittasi so'z oxiridagi qo'shimcha bilan, boshqalari (kichiklari) esa so'z boshida nomlanadi. Yon zanjirda joylashgan barcha guruhlar alfavit tartibda keltiriladi.

Organik birikma tarkibida bir nechta funksional guruhlar mavjud bo'lganda bu funksional guruhlarning katta-kichikligi quyidagi shartli kichiklashib boruvchi jadval ketma-ketligi asosida aniqlanadi.

3-jadval

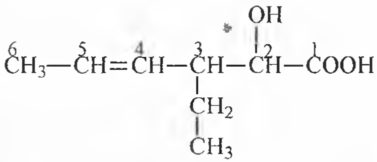
Organik birikma tarkibidagi funksional va xarakteristik guruhlarning nomlari, formulalari, so'z oldidagi (*prefiks*), so'z oxiridagi (*suffiks*) qo'shimchalari va kichiklashib borish qatori

Nomi	Formulasi	Qo'shimchalari	
		So'z oldida	So'z oxirida
Kationlar	X^+ ($-N^+R_3$, $-O^+R_2$)	Onio-	-oniy
Karboksil	-COOH	Karboksi-	-kislota
Sulfo	$-SO_3H$	Sulfo-	-sulfokislota
Tuzlar	-COOM	-	metal... -karboksilat
Kislota angidridi	$(-CO)_2O$	-	Angidrid
Murakkab efir	-COOR -(C)OOR	Alkoksikarbonil	R...-karboksilat Oat
Galogenangidrid	-COCl	Xlorformil-	-oilxlorid

Amid	-$CONH_2$ -(C)ONH_2	Kabamoil-	-karboksamid -amid
Amidin	-C(=NH)-NH_2 -(C)(=NH)- NH_2	Amidino-	- karboksiamidi n –amidin
Nitril	-CN -(C)N	Siano-	-karbonitril -nitril
Aldegid	-CHO	Formil- Okso-	-karbaldegid -al
Keton	>C=O	Okso-	-on
Spirt, fenol	-OH	Gidroksi-	-ol
Tiol	-SH	Merkapto-	-tiol
Gidroperekisi (gidroperoksid)	-O-O-R	R-gidroperoksi	R- gidroperoksid (R- gidroperekis)
Amin	-NH_2	Amino-	-amin
Imin	=NH	Imino-	-imin
Oddiy efir	-OR	Alkoksi-	oksid (efir)
Sulfid	-SR	Alkiltio-	Sulfid
Peroksid	-O-O-	Dioksi-	-peroksid
Galogen xosila	-F,-Cl, -Br, -I	ftor, xlor, brom, yod	Galogenid
	-ClO	Xlorozil-	
	-ClO_2	Xloril-	
	-ClO_3	Perxloril-	
	-IO	Yodozil-	
	-IO_2	Yodil-	
	-I$(OH)_2$	Digidroksiyod-	
Diazobirikma	=N_2	Diazo-	
	-N_3	Azido-	
Nitrozobirikma	-NO	Nitrozo-	-
Nitrobirikma	-NO_2	Nitro-	-
	=N(O)OH	Atsi-nitro-	-
	-OR	R-oksi-	
	-SR	R-tio-	

Alken	-C=C-	-	-en
Alkin	-C≡C-	-	-in

Yuqorida aytilganlarga muvofiq quyidagi birikmani nomlaymiz.



O‘zak – **geks-**, to‘yinmaganlik darajasi – **en**, bosh (asosiy) funksional guruh qo‘shimchasi **kislota**, yon zanjirdagi guruhlar **2-gidroksi** va **3-etil**.

To‘liq nomi **3-etil-2-gidroksigeksen-4-kislota**.

Organik birikmani uning formulasi asosida nomlashda yoki uning o‘rinbosarli nomenklaturadagi nomi asosida formulasi yozilganda quyidagi qoidalarga amal qilish kerak:

1. Birikma tarkibidagi asosiy (bosh) funksional guruhni va uning so‘z ohiridagi qo‘shimchasini aniqlash.

2. Bosh va asosiy funksional guruhlarni o‘z ichiga oluvchi eng uzun va eng ko‘p tarmoqlangan uglerod zanjirining yoki xalqaning nomini aniqlab, bosh funksional guruh uglerod atomidan boshlab zanjirni raqamlash, raqamlarni (lokantlarni) qo‘shimchadan oldin yoki **so‘z** ohirida qo‘shimchadan keyin qo‘yish.

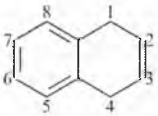
3. **-an, -en** va **-in** qo‘shimchalaridan hamda siklik va geterosiklik qatorlarda digidro, tetragidro kabi old qo‘shimchalardan foydalanib zanjir yoki xalqaning to‘yinganlik darajasini aniqlash. Molekula tarkibida qo‘shbog‘ xamda uchbog‘ birgalikda kelsa qo‘shbog‘ yaqin tomondan raqamlash.

4. **Di-**, **tri-**, **tetra-** kabi old qo‘shimchalarning alfavitga ta’sir etmasligini hisobga olgan holda yon zanjirdagi turli guruhlarni nomlashning old qismida alfavit tartibida joylashtirish.

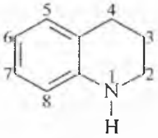
O‘rinbosarli nomenklaturada ham 1-jadvalda keltirilgan uglevodorod qoldiqlarining nomlaridan foydalaniladi. Agar bu guruhlar tarkibida uglerod atomlari ko‘payib, murakkab ko‘rinish olsa u zanjirga ulangan joyidan boshlab alohida raqamlab nomlanadi.

I.4. Additiv nomenklatura

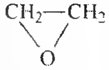
Additiv nomlashga misollar:



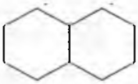
1,4-digidronaftalin (1 va 4 raqamdagi uglerod-larda qo'shbog' bo'lmagan-ligi va u vodorod atomi bilan birikanini anglatadi)



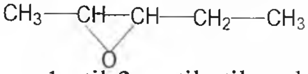
1,2,3,4-tetragidroxinolin (1,2,3,4 raqamdagi atomlar ham huddi shunday vodorod bilan to'yingan)



etilenoksid



dekagidronaftalin

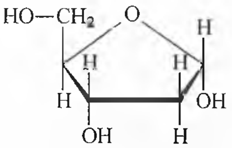


1-etil-2-metil-etilen oksid

I.5. Subtraktiv nomenklatura

Subtraktiv nomlashga misollar:

Degidrobenzol (benzolda ikkita vodorod atomi yo'qligini bildiradi)



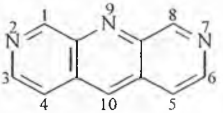
Dezoksiriboza (riboza molekulasida bitta gidroksi guruh yoqligini bildiradi)

I.6. "a" nomenklatura

"a" nomlashga misollar: (geteroatomlarning alfavit tartibda nomlanishi)

$$\overset{12}{C}H_3-\overset{11}{C}(=O)-\overset{10}{C}H_2-\overset{9}{N}H-\overset{8}{C}H_2-\overset{7}{C}H_2-\overset{6}{O}-\overset{5}{C}H_2-\overset{4}{C}H_2-\overset{3}{O}-\overset{2}{C}H_2-\overset{1}{C}OOH$$

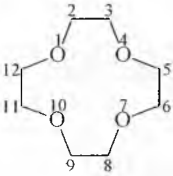
9-aza-3,6-dioksa-11-oksododekankislota



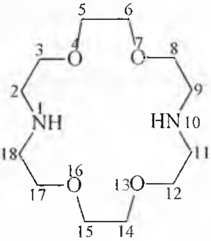
2,7,9-triazaantrasen

IYuPAK nomenklaturasi bo'yicha makrosiklik birikmalarni nomlash juda qiyin va noqulaydir. Masalan (IV) birikmani ushbu nomenklaturada nomlasak uning to'liq nomi 2,3,11,12-dibenzo-1,4,7,10,13,16-geksaoksasiklooktadeka-2,11-dien. Olinayotgan makro-siklik birikmalar sonining ortishi va ular tuzilishining murakkablashishi bilan bu birikmalarni nomlashni sistemalashtirish zarur bo'ldi. Lekin taklif qilingan bir nechta nomlashlardan hech qaysisi keng qo'llanilmadi. Shunday nomlashlardan biriga asosan (IV) birikmani quyidagicha nomlash taklif etilgan 2,3,11,12-benzo-18-,2,11-dien-1,4,7,10,13,16-O_6.

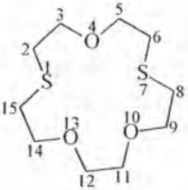
Makrosiklik birikmalarni nomlashda odatda ratsional nomenklatura qo'llaniladi. Poliefirlarni birinchi bo'lib sintez qilgan. Ch.Pedersen taklif qilgan nomenklaturada kraun efirlarni nomlashda xalqadagi umumiy uglerod va geteroatomlar soni yig'indisi ko'rsatiladi va u "kraun" so'zidan oldin qo'yiladi."Kraun" so'zidan keyin esa geteroatomlar soni ko'rsatiladi. Agar xalqaga siklobirikma birikkan yoki xalqada kislorod atomidan boshqa geteroatom joylashgan bo'lsa, ularning xalqadagi tartib nomeri va nomi eng avval ko'rsatiladi. IYuPAK nomenklaturasiga ko'ra kraun-efirlar siklik uglevodo-rodlarning hosilalari sifatida qaraladi. (IV) birikmani yuqoridagi taklif asosida nomlanadigan bo'lsa 2,3,11,12-benzoni dibenzo, siklooktadeka xalqani 18-kraun deb, 1,4,7,10,13,16-geksaoksa ya'ni geteroatomlar soni 6 deb belgilanadi va u dibenzo-18-kraun-6 deb nomlanadi:



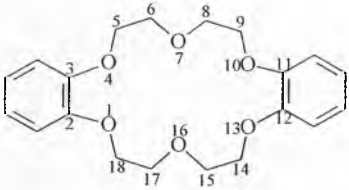
I



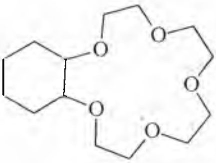
II



III



IV



V

formula I – 12-kraun-4; (1,4,7,10-tetraoksasiklododekan);
formula II – 1,10-diaza-18-kraun-6; (1,4,10,13-tetraoksa-7,16-diazasiklooktadekan);
formula III – 1,7-ditia-15-kraun-5;
formula IV – dibenzo-18-kraun-6;
formula V – siklogeksano-15-kraun-5.

I.7. Freonlarni nomlash

Freonlarda C, F, Cl, H atomlari bo'lishi mumkin. Freonni nomlash uchun biz quyidagi qoidalarni bilishimiz kerak. Freonni nomlashda uni F-C-1 H+1 F formulaga qo'yib nomlaymiz. Bunda freon tarkibidagi C atomini qiymatini C-1 formula orqali hisoblaymiz. Agar freon tarkibida bitta C atomi bo'lsa unda 1-1=0 ya'ni 0. H atomini soniga bir raqamini qo'shamiz. Agar H atomi bo'lmasa 0+1=1 raqami qo'yiladi. F nechta bo'lsa o'sha son qo'yiladi.

CF_2Cl_2 formulali freonni nomlasak.

C=1-1=0

H=0+1=1

F=2

Yuqoridagi freon nomi F-012 yoki oddiygina F-12 bo'ladi.

Freonning nomi asosida formulani yozishda esa F-[C-1][H+1] F (Cl) formuladan foydalanamiz. Uglerod atomining 4 valentligiga asoslanib H va F sonidan to‘lmay qolgan valentligini Cl atomi bilan to‘ldiramiz. Nomi F-022 yoki F-22 bo‘lgan freon formulasini yozamiz.

C=0 ekan bu degani 1-1=0 ya’ni 1 ta uglerod atomi bor.

H=2. 1+1=2, demak 1 ta H atomi bor.

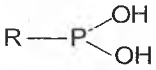
F=2 ta ftor bor.

CHF_2. H va F lar yig‘indisi 3 demak 1 ta Cl atomi xam bor ekan. CHF_2Cl

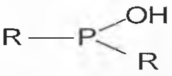
I.8. Fosfor organik birikmalarni nomlash

Fosfinlar: PH_3, RPH_2, R_2PH, R_3P, $R_4P^+X^-$.

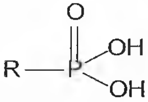
Trifenilfosfinmetilen, metilentrifenilfosforan, trifenilfosforilid $(C_6H_5)_3P=CH_2$



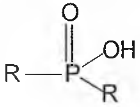
Fosfonit kislota



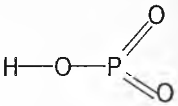
Fosfinit kislota



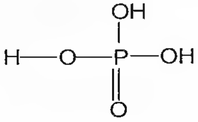
Fosfonat kislota



Fosfinat kislota

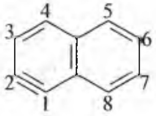


Metafosfat kislota



Ortofosfat kislota

Misollar.

1.  berilgan moddani nomlang.

Yechish:

Birinchi va ikkinchi uglerodda vodorod yoqligi ko‘rsatib o‘tamiz. 1,2-degidronaftalin.

2. Quyidagi moddani nomlang. $CH_3-CH=CH-CH(OH)-CH_2-COOH$

Yechish:

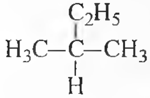
$$\overset{6}{C}H_3-\overset{5}{C}H=\overset{4}{C}H-\overset{3}{C}H(OH)-\overset{2}{C}H_2-\overset{1}{C}OOH$$

O‘zak – **geks-**, to‘yinmaganlik darajasi – **en**, bosh (asosiy) funksional guruh qo‘shimchasi **kislota**, yon zanjirdagi funksional guruh **3-gidroksi**.

To‘liq nomi **3-gidroksigeksen-4-kislota**.

Topshiriqlar.

1. Organik birikmalarning nomlash turlariga misollar keltiring.
2. Quyidagi moddani ratsional nomenklatura bo‘yicha nomlang.



3. Quyidagi moddani radikal-funksional nomenklatura bo‘yicha nomlang.

$CH_3-CH(OH)-CH_3$

4. 2-metil-3-etilpentil radikalining tuzilishini yozing.
5. 3-etil-2-xlorgeksen-5 kislotaning tuzilish formulasini yozing.
6. 1,2-dimetiletilenoksidning tuzilish formulasini yozing.
7. 3-dezoksiribozaning tuzilish formulasini yozing.
8. Dibenzo-18-kraun-6 ning tuzilish formulasini yozing.
9. F-13 freon formulasini yozing.

II. Turli sinf organik birikmalarini nomlash. To‘yingan organik birikmalarni nomlash.

II.1. Alkanlar
Trivial nomenklatura

Alkanlarning boshlang‘ich vakillari bu nomenklaturada tasodifiy nomlangan: CH_4-metan, C_2H_6-etan, C_3H_8-propan, C_4H_{10}-butan. Odatda agar ikkita metil radikali bitta oxirgi uglerodda joylashsa ***izo-*** old qo‘shimchasi ishlatiladi.

$CH_3-CH-CH_3$
$|$
CH_3

Izobutan

$CH_3-CH-CH_2-CH_3$
$|$
CH_3

Izopentan

$CH_3-CH-CH_2-CH_2-CH_3$
$|$
CH_3

Izogeksan

CH_3
$|$
CH_3-C-CH_3
$|$
CH_3

Neopentan

CH_3
$|$
$CH_3-C-CH_2-CH_3$
$|$
CH_3

Neogeksan

To‘rtlamchi uglerod atomli uglevodorod nomlarining oldiga neo- old qo‘shimchasi qo‘shiladi.

Ratsional nomenklatura

Agar tarmoqlangan uglevodorodning ikki tomoni simmetrik bo‘lsa uni dialkil deb qarasak ham bo‘ladi. Masalan:

$CH_3 \quad\quad CH_3$
$\searrow \quad \nearrow$
$CH-CH$
$\nearrow \quad \searrow$
$CH_3 \quad\quad CH_3$

Diizopropil

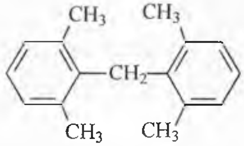
Alkanlarni ratsional nomenklaturada nomlashda ularning birinchi vakili CH_4- metaning vodorod atomlari uglevodorod radikaliga

almashgan hosilasi deb qaraladi. Agar o‘xshash radikallar mavjud bo‘lsa ularning soni di-, tri-, tetra-, penta- va x.k. deb ko‘rsatiladi.

$$CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}H}-CH_3 \qquad\qquad CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}H}-CH_2-CH_3$$

trimetilmetan — dimetiletilmetan

Agar di-, tri-, tetra-, penta- va x.k. ishlatilgan bo‘lsa biz bis-, tris-, tetrakis- kabi qo‘shimchalardan xam foydalanamiz.



bis-(orto,orto′-dimetilfenil)-metan

Sistematik nomenklatura

Alkanlarni sistematik nomenklatura asosida nomlashda quyidagi qoidalarga amal qilish kerak.

1. Tarmoqlangan uglevodorodning eng uzun va eng ko‘p tarmoqlangan uglerod zanjiri belgilab olinadi. Ular arab sonlari bilan raqamlanadi.

2. Raqamlash radikal yaqin tomondan boshlanadi. Radikal bu asosiy uglerod zanjiri tarkibiga kirmagan uglevodorod qoldigi. Radikalning asosiy raqamlangan zanjirdagi nechanchi uglerodda turganligini arab raqami bilan ko‘rsatib chiziqcha qo‘yiladi va radikal nomi ko‘rsatiladi. Keyin asosiy uglevodorod nomi keltiriladi.

$$\overset{1}{C}H_3-\underset{\displaystyle CH_3}{\underset{|}{\overset{2}{C}H}}-\overset{3}{C}H_2-\overset{4}{C}H_3$$

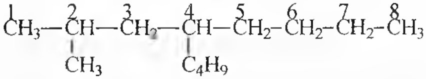
2-metilbutan

3. Agar asosiy uglerod zanjirini raqamlashda ikkita har xil radikal teng tomonda joylashib qolgan paytda alfavitda oldin keluvchi radikal yaqin tomondan raqamlanadi.

$$\overset{1}{C}H_3-\overset{2}{C}H_2-\underset{\displaystyle C_2H_5}{\underset{|}{\overset{3}{C}H}}-\underset{\displaystyle CH_3}{\underset{|}{\overset{4}{C}H}}-\overset{5}{C}H_2-\overset{6}{C}H_3$$

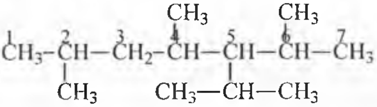
3-etil-4-metilgeksan

4. Radikallar ishlatilayotgan alfavit ketma-ketligida yoziladi. Quyidagi misolda ikkita metil va butil radikali bor. Radikallar “m” va “b” xarfidan boshlanadi. Alfavit bo‘yicha “b” xarfi birinchi keladi keyin “m” xarfi (di-, tri-, izo-, neo-, ikki-, uchlamchi- va boshqalar bundan mustasno).

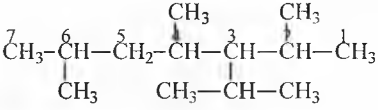


4-butil-2-metiloktan

5. Agar birikma tarkibida bir nechta radikallar bo‘lsa, raqamlashda birinchi va oxirgi radikallar o‘xshash bo‘lsa asosiy uglerod zanjirni qaysi tomondan raqamlash to‘g‘riligini bilish uchun ikkala xoldagi radikallarga mos keladigan uglerod raqamlarini yig‘indisi topiladi. Qaysi xolatda eng kichik yig‘indi chiqsa o‘sha tomondan raqamlanadi.



I

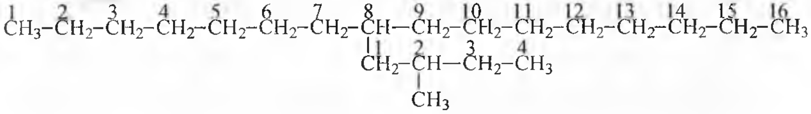


II

(2+4+5+6=17) (2+3+4+6=15)

Demak II xolat bo‘yicha raqamlanadi va nomi 3-izopropil-2,4,6-trimetilgeptan bo‘ladi.

6. Radikalni o‘zi xam tarmoqlangan bo‘lsa, radikalni o‘zini nomlab qavs ichiga yoziladi. Radikalni nomlashda raqamlash asosiy zanjirga birikkan uglerodan boshlanadi.



8-(2-metilbutil)geksadekan

II.2. Organik galogenli birikmalar. Trivial nomenklatura

$CHCl_3$ xloroform; CHI_3 yodoform; CHF_3 ftoroform; $CHBr_3$ bromoform.

CCl_4 uglerod tetraxlorid (to‘rt xlorli uglerod); CF_4 uglerod tetraftorid (to‘rt ftorli uglerod); CI_4 uglerod tetrayodid (to‘rt yodli uglerod); CBr_4 uglerod tetrabromid (to‘rt bromli uglerod).

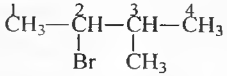
Radikal-funksional nomenklatura

Radikal nomi keltirilib ohirida galogen nomini 3-jadval asosida galogen suffiksi ishlatiladi.

CH_3Cl metilxlorid; CH_2Cl_2 metilenxlorid; $(CH_3)_3CCl$ uchlamchi butilxlorid.

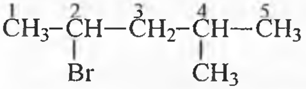
O‘rinbosarli nomenklatura

Eng uzun uglerod zanjiri tanlab olinib galogen yaqin tomondan raqamlanadi. Galogen joyi esa arab raqami bilan ko‘rsatilib galogen nomi keltiriladi. Radikal va galogen nomi alfavit tartibda yoziladi.

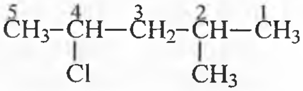


2-brom-3-metilbutan

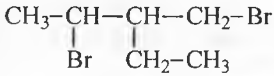
Asosiy uglerod zanjiri tuzilish tarkibida galogen atomlaridan tashqari uglevodorod radikallari bo‘lgan bir nechta o‘rinbosar mavjud bo‘lsa ularni alfavit tartibda keltiriladi. Asosiy zanjir uglerod atomlarini raqamlanganda u birinchi nomlangan o‘rinbosarga yaqin tomondan raqamlanadi.



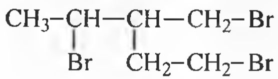
2-brom-4-metilpentan



2-metil-4-xlorpentan



2-brom-3-brommetilpentan



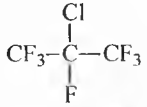
2,5-dibrom-3-brommetilpentan

Uglevodorod tarkibidagi xamma vodorod atomlari bir xildagi galogen atomlariga almashingan bo‘lsa unda per- (perftor-, perxlor-, perbrom-, peryod-) old qo‘shimchasi qo‘llaniladi:

$CF_3CF_2CF_2CF_2CF_3$ perftorpentan

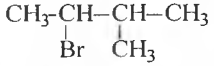
$CCl_3CCl_2CCl_3$ perxlorpropan

Agar uglevodorod tarkibidagi xamma vodorod atomi turli xildagi galogen atomlariga almashingan bo‘lsa unda per- old qo‘shimchasi qo‘llanilmaydi:

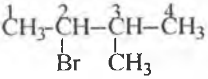


2-xlorgeptaftorpropan

Misollar.

1.  berilgan moddani nomlang.

Yechish:



B xarfi birinchi kelgani uchun raqamlash Br yaqin tomondan boshlanadi. 2-brom-3-metilbutan.

2. Quyidagi moddani nomlang CCl_3-CCl_3.

Yechish:

Uglevodorod tarkibidagi barcha vodorodlar xlor atomiga almashgani uchun per-old qo'shimchasini qo'llaymiz. Moddaning nomi perxloretan.

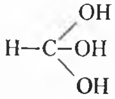
Topshiriqlar.

1. Galogen organik birikmalar qanday nomenklaturada nomlanadi. Misol bilan tushuntiring.
2. 1-brom-3-brommetilpentanning barcha izomerlarini yozing va nomlang.

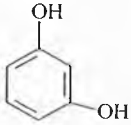
II.3. Spirtlar va fenollar. Trivial nomenklatura

Ko'pchilik spirtlar trivial nomenklatura bo'yicha nomlanadi.

CH_3OH	C_2H_5OH	C_6H_5OH
yog'och spirti	vino spirti	Fenol
yoki karbinol		(karbol kislota)

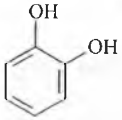


ortochumoli kislota

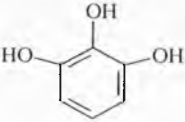


rezorsin

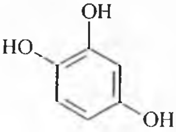
gidroxinon



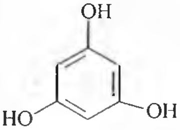
pirokatexin



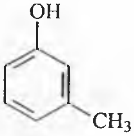
pirogallol



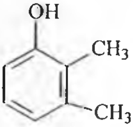
oksigidroxinon



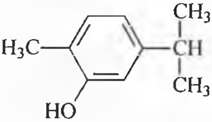
floroglyutsin



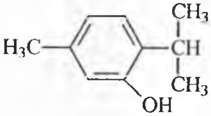
m-krezol



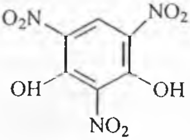
2,3-ksilenol



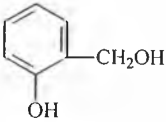
karvakrol



timol



stifnin kislota



salitsil kislota

Ratsional nomenklatura

Alifatik spirtlarni nomlashda ularning birinchi vakili karbinolning vodorod atomlari radikalga almashgan hosilasi deb qaraladi.

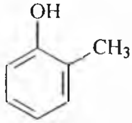
$$CH_3-\underset{\underset{OH}{|}}{CH}-CH_3 \qquad\qquad C_6H_5-\underset{\underset{OH}{|}}{CH}-CH_3$$

dimetilkarbinol metilfenilkarbinol

Radikal-funksional nomenlatura bo‘yicha nomlaganimizda spirt so‘zidan foydalanamiz.

$$CH_3\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}OH$$

birlamchi butil spirt



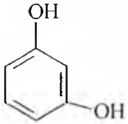
o-metil fenol

$$CH_3-\underset{\underset{OH}{|}}{CH}-CH_3$$

ikkilamchi propil spirti
(izopropil spirt)

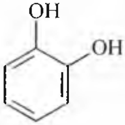
$$CH_3-\overset{\overset{CH_3}{|}}{\underset{\underset{OH}{|}}{C}}-CH_3$$

uchlamchi butil spirt

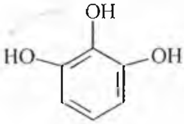


m-digidroksibenzol

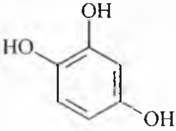
p-digidroksibenzol



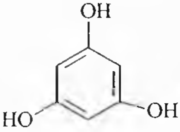
o-digidroksibenzol



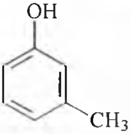
1,2,3-trigidroksibenzol



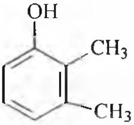
1,2,4-trigidroksibenzol



1,3,5-trigidroksibenzol



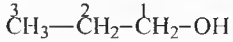
m-metilfenol

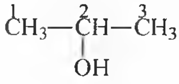


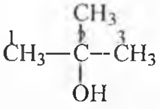
o,m-dimetilfenol

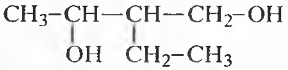
O‘rinbosarli nomenklatura

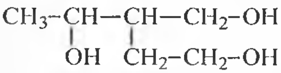
O‘rinbosarli nomenklatura bo‘yicha nomlashda doimgidek eng uzun uglerod zanjiri tanlib olinadi va raqamlash OH gurux yaqin joydan boshlanadi. OH guruxni **ol-** suffiks bilan nomlanadi va uning turgan joyi arab raqami bilan ko‘rsatiladi.


propanol-1


propanol-2

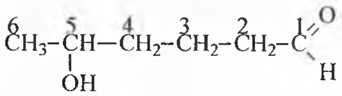

2-metilpropanol-2


2-etilbutandiol-1,3

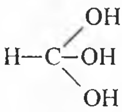

3-gidroksimetilpentandiol-1,4

3-gidroksimetil-pentanol-2

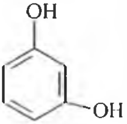
Asosiy uglerod zanjirida OH- guruhdan tashqari boshqa OH- dan katta funksianal guruh mavjud bo‘lsa raqamlash OH- dan katta funksianal guruhga yaqin ugleroddan boshlanadi:


5-gidroksigeksanal

Radikal holda kelgan RO-ni nomlash uchun xuddi HO dagi gidroski so‘zidagi **“gidr”** so‘zi o‘rniga uglevodorod radikali nomidagi il qo‘shimchasi tushib qoldirilib **“oksi”** so‘ziga qo‘shiladi. CH_3O- metoksi; CH_3CH_2O- etoksi; $CH_3CH_2CH_2O$- propoksi; $CH_3CH_2CH_2CH_2O$- butoksi; $(CH_3)_2CHO$- izopropoksi; $(CH_3)_2CHCH_2O$- izobutoksi; $CH_3CH_2CH(CH_3)O$- ikkilamchi butoksi; $(CH_3)_3CO$- uchlamchi butoksi; -O-CH_2-O- metilendioksi; -O-CH_2-CH_2-O- etilendioksi; -O-CH_2-CH_2-CH_2-O- trimetilendioksi.

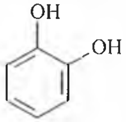

metantriol, trigidroksimetan

Ikki valentli radikal holida –ORO- kelganda –dioksi suffiksi qo‘shiladi. $-O-CH_2-O-$ metilendioksi; $-O-CH_2-CH_2-O-$ etilendioksi; $-O-CH_2-CH_2-CH_2-O-$ trimetilendioksi.

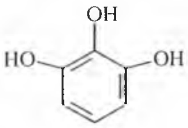


1,3-digidroksibenzol

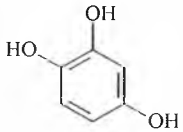
1,4-digidroksibenzol



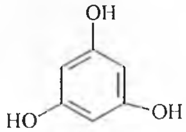
1,2-digidroksibenzol



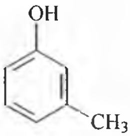
1,2,3-trigidroksibenzol



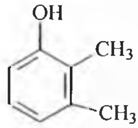
1,2,4-trigidroksibenzol



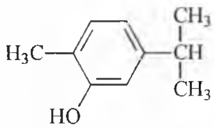
1,3,5-trigidroksibenzol



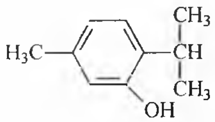
3-metil-1-gidroksibenzol



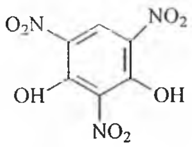
2,3-dimetil-1-gidroksibenzol



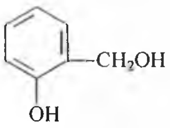
5-izopropil-2-metilfenol



2-izopropil-5-metilfenol



2,4,6-trinitro-1,3-digidroksibenzol



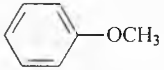
2-gidroksifenilmetanol

II.4. Oddiy efirlar. Radikal-funksional nomenklatura

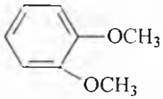
Oddiy efirlarni nomlashda kislorodning ikki tomonidagi radikallar nomi aytilib **efir** so‘zi qo‘shiladi.

CH_3-O-CH_3
dimetil efir

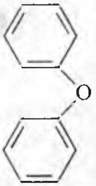
CH_3-O-C_2H_5
metiletil efir



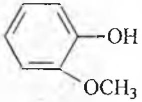
metilfenil efir



pirokatexinning dimetil efiri



difenil efir



o-girdoksimetoksibenzol

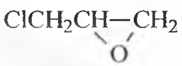
$ClCH_2CH_2OCH_2CH_2Cl$
bis(2-xloretil)efir

$HOCH_2CH_2OCH_2CH_2OH$

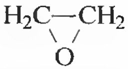
2,2`-**oksi**dietanol

$HOOCCH_2CH_2OCH_2CH_2COOH$

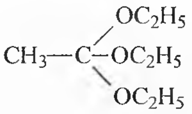
3,3`-**oksi**dipropion kislota



1-xlor-2,3-**epoksi**propan



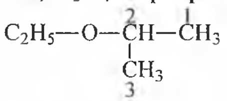
epoksietan



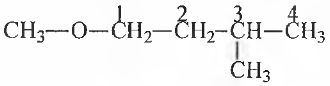
ortosirka kislotasining etil efiri

O'rinbosarli nomenklatura

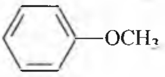
Har doimgidek eng uzun uglerod zanjirini belgilab olanadi. Ikkinchi kichik radikal esa kislorod bilan birgalikda funksional guruh deb qaraladi. Asosiy zanjirni raqamlash esa kislorod atomi yaqin joydan boshlanadi. RO-ni nomlash uchun xuddi HO dagi gidroski so'zidagi **"gidr"** so'zi o'rniga uglevodorod radikali nomidagi il qo'shimchasi tushib qoldirilib **"oksi"** so'ziga qo'shiladi. Masalan CH_3O- metoksi, C_2H_5O- etoksi, C_3H_7O- propoksi va x.k.



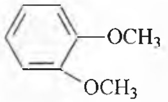
2-etoksipropan



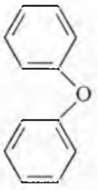
1-metoksi-3-metilbutan



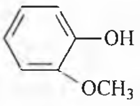
metoksibenzol



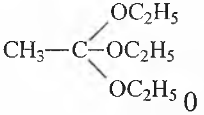
1,2-dimetoksibenzol



fenoksibenzol



2-metoksifenol



1,1,1-trietoksietan

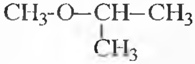
Kraun efirlarni nomlash birinchi bobda keltirilgan.

Peroksidlar

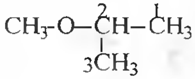
R-O-O-H tarkibli birikmalarni nomlashda R radikal nomiga **gidroperoksid** prefiksi qo‘shiladi: CH_3OOH metilgidroperoksid.

R^1-O-O-R^2 tarkibli birikmani nomlashda R^1 va R^2 radikalarning nomlari alfavit tartibda yoki o‘sib borish tartibda yozib keyin **peroksid** prefiksi yoziladi. $C_4H_9OOCH_3$ butilmetilperoksid (alfavit tartibi); metilbutilperoksid (murakkablik bo‘yicha).

Misollar.

1.  berilgan moddani o‘rinbosarli nomenklaturada nomlang.

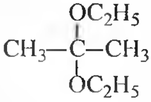
Yechish:



2-metoksipropan

2. 2,2-dimetoksipropani tuzilishini yozing.

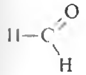
Yechish:

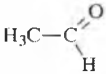


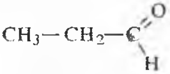
Topshiriqlar.

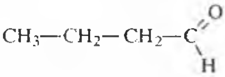
1. Spirt va fenollar qanday nomenklaturada nomlanadi. Misol bilan tushuntiring.
2. $C_4H_{10}O$ formulaga mos keladigan spirt va oddiy efirlarning barcha izomerlarini yozing va barcha nomenklaturada nomlang.

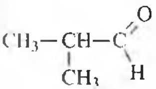
II.5. Aldegid va ketonlar. Ketenlar. Trivial nomenklatura

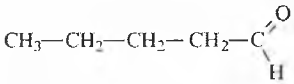

chumoli aldegid

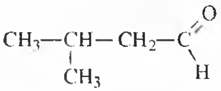

sirka aldegid

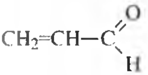

propion aldegid

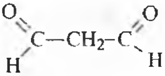

moy aldegid

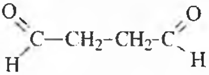

izomoy aldegid

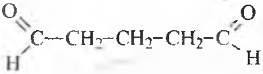

valerian aldegid

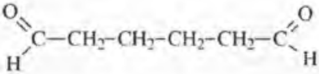

izovalerian aldegid


akrolein, akril aldegid

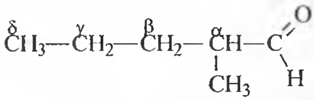

malon aldegid

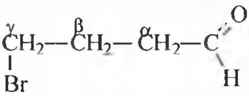

qahrabo aldegid

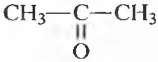

glutar aldegid

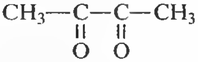

adipin aldegid

Kam hollarda o‘rinbosarlarning holati grek xarfi bilan ifodalanadi.


α-metilvalerian aldegid

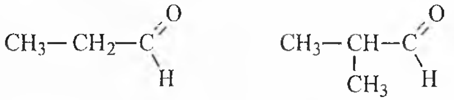

γ-brommoy aldegid


aseton


diasetil

Ratsional nomenlatura

Aldegidlarni nomlashda sirka aldegidni asos qilib olinadi.



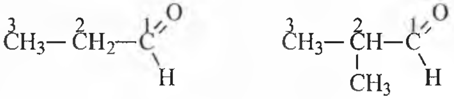
metilsirka aldegid dimetilsirka aldegid

Ketonlarni nomlashda karbonil guruxining ikki tomonidagi radikallar nomi keltirilib keton so'zi qo'shiladi.

metiletil keton metilizobutil keton

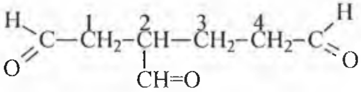
Sistematik nomenklatura

Aldegidlarni sistematik nomenklaturada nomlashda karbonil guruhidagi uglerod atomidan raqamlashni boshlab eng uzun zanjir tanlib olinadi va –al suffiksi qo'shiladi.

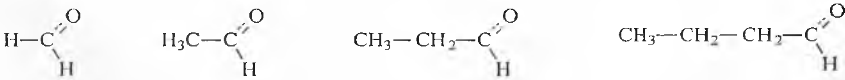


proponal 2-metilproponal

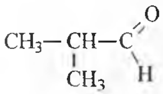
Atsiklik polialdegidlarni nomlashda, ikkita aldegid guruhidan ko'proq bo'lganda, ikki xil usulda nomlash mumkin. Birinchisida eng uzun zanjir tanlab olinadi va raqamlanadi. Bunda aldegid guruhi asosiy zanjirga kiritilmaydi va –trikarbaldegid, –tetrakarbaldegid suffiksi qo'shiladi.



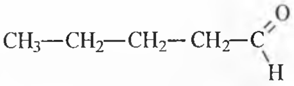
1,2,4-butantrikarbaldegid



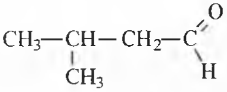
formaldegid atsetaldegid propionaldegid butiraldegid



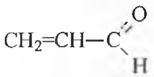
izobutiraldegid



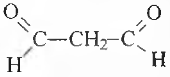
valeraldegid



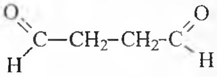
izovaleraldegid



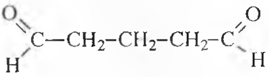
akrilaldegid



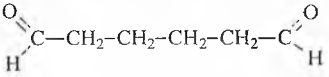
malonaldegid



suksinaldegid

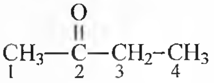


glutaraldegid

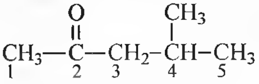


adipaldegid

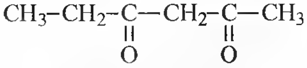
Ketonlarni nomlashda uglerod zanjiri karbonil gurux yaqin uglerod tomondan raqamlanadi va karbonil uglerod atomi raqami koʻrsatilib uglevodorod nomiga –on qoʻshimchasi qoʻshiladi.



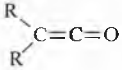
butanon-2

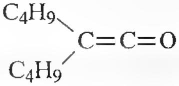


4-metilpentanon-2

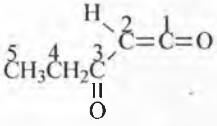


2,4-geksandion

Ketenlar- bu  tarkibli birikma. Ular oʻrinbosarli nomenklatura boʻyicha nomlanadi.



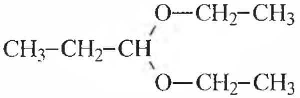
dibutilketen



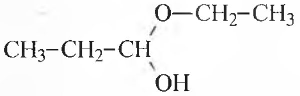
propionilketen yoki 1-penten-1,3-dion

Aldegid va ketonlarning xosilalarini nomlash quyidagicha bo‘ladi:

Atsetallar. Bular >$C(OR_1)(OR_2)$ guruh saqlagan birikmalar. Bularni nomlashda dialkoksibirikmalar sifatida xamda aldegid yoki keton nomini keltirib keyin radikallar nomini qo‘shib **–atsetal** suffiksini keltirsa xam bo‘ladi.

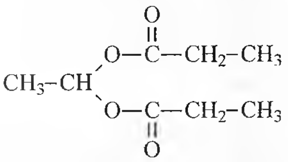


1,1-dietoksipropan yoki propanaldegid dietilatsetal

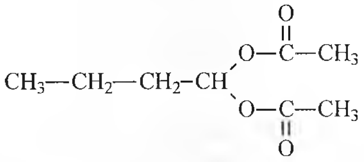


1-etoksi-1-propanol, propanaldegid yarim atsetali

Atsilallar. Bularga $R^1CH(OCOR^2)_2$ yoki $R^1(R^2)CH(OCOR^3)$ birikmalarga mos. Ba’zan bu birikmalar murakkab efirlar singari nomlanadi.

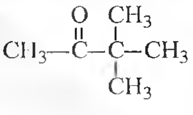


etilidendipropionat



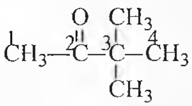
butilidendiatsetat

Misollar.



1. berilgan moddani sistematik nomenklaturada nomlang.

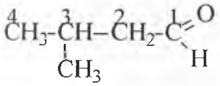
Yechish:



3,3-dimetilbutanon-2

2. Izovaleraldegidni sistematik nomenklaturada nomlang.

Yechish:



3-metilbutanal

Topshiriqlar.

1.Ketenlar nima va qanday nomlanadi? Misol bilan tushuntiring.

2. Atsetallar nima va qanday nomlanadi? Misol bilan tushuntiring.

3. Atsiallar nima va qanday nomlanadi? Misol bilan tushuntiring.

4. Adipin aldegidning barcha izomerlarining tuzilish formulalarini yozing va turli nomenklaturada nomlang.

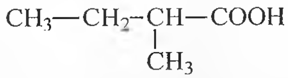
II.6. Karbon kislotalar.
Bir asosli kislotalar

Kislota formulasi	Trivial nomenklatura	Tuzi va murakkab efirining nomi
HCOOH	Chumoli kislota	Formiat
CH_3COOH	Sirka kislota	Asetat
CH_3CH_2COOH	Propion kislota	Propionat
$CH_3(CH_2)_2COOH$	Moy kislota	Butirat
$CH_3(CH_2)_3COOH$	Valerian kislota	Valerat
$CH_3(CH_2)_4COOH$	Kapron kislota	Kapronat
$CH_3(CH_2)_6COOH$	Kapril kislota	Kaprilat
$CH_3(CH_2)_8COOH$	Kaprin kislota	Kaprinat
$CH_3(CH_2)_{10}COOH$	Laurin kislota	Laurinat
$CH_3(CH_2)_{12}COOH$	Miristin kislota	Miristinat
$CH_3(CH_2)_{14}COOH$	Palmitin kislota	Palmitinat (palmitat)
$CH_3(CH_2)_{16}COOH$	Stearin kislota	Stearinat (stearat)
$CH_3(CH_2)_{18}COOH$	Araxin kislota	Araxinat

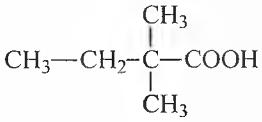
Ratsional nomenklatura

Ratsional nomenklaturada nomlashda bir asosli karbon kislotalarni **sirka kislota xosilasi** deb qaraladi.

CH_3CH_2COOH – metilsirka kislota $CH_3CH_2CH_2COOH$ – etilsirka kislota



metiletilsirka kislota

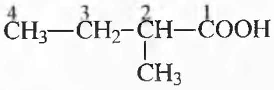


dimetiletilsirka kislota

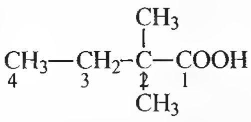
Sistematik nomenklatura

Bir asosli karbon kislotalarni sistematik nomenklaturada nomlashda karboksil gurux saqlagan eng uzun uglerod zanjir belgilanadi. Raqamlash karboksil guruxidagi uglerod atomidan boshlanadi. Uzun zanjir belgilanib olinadi va uglevodorod nomiga **kislota** so‘zi qo‘shiladi.

$HCOOH$	metan kislota
CH_3COOH	etan kislota
CH_3CH_2COOH	propan kislota
$CH_3(CH_2)_2COOH$	butan kislota
$CH_3(CH_2)_3COOH$	pentan kislota



2-metilbutan kislota



2,2-dimetilbutan kislota

Ikki asosli kislotalar

Kislota formulasi	Trivial nomenklatura	Sistematik nomenklatura
HOOC-COOH	Oksalat kislota	Etan dikislota
$HOOC\text{-}CH_2\text{-}COOH$	Malon kislota	Propan dikislota
$HOOC\text{-}(CH_2)_2\text{-}COOH$	Qaxrabo kislota	Butan dikislota
$HOOC\text{-}(CH_2)_3\text{-}COOH$	Glutar kislota	Pentan dikislota
$HOOC\text{-}(CH_2)_4\text{-}COOH$	Adipin kislota	Geksan dikislota

HOOC-$(CH_2)_5$-COOH	Pimelin kislota	Geptan dikislota
HOOC-$(CH_2)_6$-COOH	Probka kislota	Oktan dikislota
HOOC-$(CH_2)_7$-COOH	Azelain kislota	Nonan dikislota
HOOC-$(CH_2)_8$-COOH	Sebatsin kislota	Dekan dikislota

Ikki asosli kislota anion va tuzlarining nomlari

Kislota formulasi	Trivial nomenklatura	Sistematik nomenklatura
-OOC-CH_2-COO-	Malonat dianion	Propandioat ion
KOOC-CH_2-COOK	Kaliy malonat	Kaliy propandioat
HOOC-$(CH_2)_5$-COO-		Gidrogeptandioat
HOOC-$(CH_2)_5$-COOK		Kaliy gidrogeptandioat

Karbon kislotalarning karboksil guruhidagi OH gidroksil guruhni yo'qolishidan xosil bo'lgan radikallar **atsil radikal** deyiladi. Atsil radikallarini IYuPAK nomenklaturasidan nomlashda **–oil** suffiksini mos keladigan uglevodorodga qo'shiladi: CH_3CO- etanoil. Ba'zan – **karbonil** suffiksi xam qo'llaniladi: CH_3CO- metankarbonil.

Bir asosli asosli karbon kislota atsil radikali

Radikalning tuzilish formulasi	Nomlanishi	
	trivial	Sistematik
HCO-	Formil	Metanoil
CH_3CO-	Atsetil	Etanoil (metankarbonil)
CH_3CH_2CO-	Propionil	Propanoil (etankarbonil)
$CH_3(CH_2)_2CO$-	Butiril	Butanoil (propankarbonil)
$(CH_3)_2CHCO$-	Izobutiril	2-metilpropanoil
$CH_3(CH_2)_3CO$-	Valeril	Pentanoil

		(butankarbonil)
$(CH_3)_2CHCH_2CO$-	Izovaleril	2-metilbutanoil
$(CH_3)_3CCO$-	Pivalil	Pivaloil
$CH_3(CH_2)_4CO$-	Kaproil	Geksanoil
$CH_3(CH_2)_5CO$-	Enantil	Geptanoil
$CH_3(CH_2)_6CO$-	Kaprilil	Oktanoil
$CH_3(CH_2)_7CO$-	-	Nonanoil
$CH_3(CH_2)_8CO$-	Kapril	Dekanoil
$CH_3(CH_2)_{10}CO$-	Lauril	Dodenanoil
$CH_3(CH_2)_{12}CO$-	Miristoil	Tetradekanoil
$CH_3(CH_2)_{14}CO$-	Palmitoil	Geksadekanoil
$CH_3(CH_2)_{15}CO$-	-	Geptadekanoil
$CH_3(CH_2)_{16}CO$-	Stearoil	Oktadekanoil

Ikki asosli asosli karbon kislota atsil radikali

Radikalning tuzilish formulasi	Nomlanishi	
	trivial	Sistematik
-OC-CO-	Oksalil	Etandioil
-OC-CH_2-CO-	Malonil	Propandioil
-OC-$(CH_2)_2$-CO-	Suktsinil	Butandioil
-OC-$(CH_2)_3$-CO-	Glutaril	Pentandioil
-OC-$(CH_2)_4$-CO-	Adipoil	Geksandioil
-OC-$(CH_2)_5$-CO-	Pimeloil	Geptandioil
-OC-$(CH_2)_6$-CO-	Suberoil	Oktandioil
-OC-$(CH_2)_7$-CO-	Azelaoil	Nonandioil
-OC-$(CH_2)_8$-CO-	Sebatsoil	Dekandioil
HOOC-CO-	Karboksi metanoil	Karboksimetanoil
HOOC-CH_2-CO-	-	2-karboksietanoil
HOOC-$(CH_2)_2$-CO-	-	3-karboksipropanoil
HOOC-$(CH_2)_3$-CO-	-	4-karboksibutanoil
HOOC-$(CH_2)_4$-CO-	-	5-karboksipentanoil
HOOC-$(CH_2)_5$-CO-	-	6-karboksigeksanoil
HOOC-$(CH_2)_6$-CO-	-	7-karboksigeptanoil
HOOC-$(CH_2)_7$-CO-	-	8-karboksioktanoil
HOOC-$(CH_2)_8$-CO-	-	9-karboksinonanoil
HOOC-$(CH_2)_9$-CO-	-	10-karboksidekanoil
HOOC-$(CH_2)_{10}$-CO-	-	11-karboksiundekanoil

Murakkab efirlar

Radikalning tuzilish formulasi	Nomlanishi	
	trivial (ratsional)	IYuPAK bo'yicha
$HCOOCH_3$	Metilformiat, chumoli kislota metil efiri	Metilmetanoat, metilvodorodkarboksilat
$HCOOC_2H_5$	Etilformiat, chumoli kislota etil efiri	Etilmetanoat, etilvodorodkarboksilat
$CH_3COOC_2H_5$	Etilatsetat, sirka kislota etil efiri	Etiletanoat, etilmetankarboksilat
$CH_3COOCH(CH_3)_2$	Izopropilatsetat, sirka kislota izopropil efiri	Metiletiletanoat, izopropiletanoat, izopropilmetankarboksilat
$CH_3CH_2COOC_2H_5$	Etilpropionat, propion kislota etil efiri	Etilpropanoat, etiletankarboksilat
$CH_3(CH_2)_2COOC_2H_5$	Etilbutirat, moy kislota etil efiri	Etilbutanoat, etilpropankarboksilat
$CH_3(CH_2)_3COOC_2H_5$	Etilvalerat, valerian kislotasining etil efiri	Etilpentanoat, etilbutankarboksilat

Ikki asosli kislota efirlari va tuzlarining nomlari

Kislota formulasi	Trivial nomenklatura	Sistematik nomenklatura
$C_2H_5OOC\text{-}CH_2\text{-}COOC_2H_5$	Malon kislotasining dietil efiri	Dietilmalonat
$C_2H_5OOCCH_2CH_2COOH$	Etilgidrosuktsinat	
$C_2H_5OOCCH_2CH_2COONa$	Natriyetilsuktsinat	
$ClOC(CH_2)_5COCl$		Geptandioildixlorid
$CH_3OC(CH_2)_5COCl$		Metil-xlorformilgeksanoat
$N{\equiv}C(CH_2)_4C{\equiv}N$		Geksandinitril
$N{\equiv}CCH_2COOH$	Tsianosirka kislota	Tsianosirka kislota

Yog'lar. Yog' glisterin va yuqori molekulyar kislota qoldiqlaridan tashkil topgan murakkab efirlardir. Gilitserindagi spirt guruhning eterifikatsiyalanishidan kelib chiqqan xolda mono-, di- va triglitse-

ridlarga bo'linadi. Izomer glitseridlarni farqlash maqsadida glitserin girdoksidlari grek harflari bilan ko'rsatiladi: $CH_2(OH)\alpha$-$CH(OH)\beta$-$CH_2(OH)\alpha'$.

Agar R1-stearin kislota qoldig'i, R2-palmitin kislota qoldig'i, R3-laurin kislota qoldig'i bo'lsa, glitseridlarni nomlanishini jadvalda keltirib o'tamiz.

Glitserid turi	**Tuzilish formulasi**	**Nomlanishi**
Monoglitseridlar	$HOCH_2CHCH_2OCOR^1$ | OH $HOCH_2CHCH_2OH$ | $OCOR^2$	α-stearin β-palmitin
Diglitseridlar	$R^1COOCH_2CHCH_2OCOR^2$ | OH $HOCH_2CHCH_2OCOR^2$ | $OCOR^3$	α-stearin- α'-palmitin α-stearin- β-laurin
Triglitseridlar	$R^1COOCH_2CHCH_2OCOR^3$ | OR^2 $R^1COOCH_2CHCH_2OCOR^2$ | OR^1 $R^2COOCH_2CHCH_2OCOR^2$ | OR^3	α-stearin- β-palmitin-α'- laurin α,β-stearin-α'-palmitin α,α'-palmitin-β-laurin

Ba'zi xollarda glitseridlarni nomlash murrakab efirlarni nomlagandek nomlanadi.

$$H_3C(CH_2)_{14}(O)CO—CH_2CHCH_2–OC(O)(CH_2)_{14}CH_3$$
$$|$$
$$OC(O)–(CH_2)_{14}CH_3$$

Propantriil-1,2,3-trigeksadekanoat

Murakkabroq nomlanishni ko'rib chiqamiz:

$$H_3C(O)CO—CH_2\overset{1}{C}H\overset{2}{C}H_2–OC(O)(CH_2)_2CH_3$$
$$|$$
$$OC(O)(CH_2)_{15}CH_3$$

2-(butanoiloksi)-1-[(etanoiloksi)metil]-1-(geptadekanoiloksi)etan

Quyida ba'zi karbon kislota xosilalarini ko'rib chiqamiz.

Nitrillar

Ular karboksil guruhidagi karbonil guruhi kislorodi va gidroksil guruhlar uch valentli azotga almashingan xosila. Ularni yana sinil kislotasi (tsianid) murakkab efiri deb xam qarash mumkin.

Trivial nomentklatura asosida nomlansa **nitril** suffiksi mos kislota nomiga qo'shilib yoziladi: $CH_3C{\equiv}N$ sirka kislota nitrili, atsetonitril.

Agar uni sinil kislotasi (tsianid) murakkab efiri deb xam qarasak, unda radikal nomiga **–tsianid** suffiksi qo'shiladi: $CH_3C{\equiv}N$ metiltsianid.

Sistematik nomenklaturasiga asosan esa mos uglevodorod nomiga – **nitril** suffiksi qo'shiladi: $CH_3CH_2CH_2C{\equiv}N$ butannitril.

Agar uni uglevodoroddagi vodorod atomi CN-guruhga almashgan xosila deb qaralsa, unda **tsiano-**, **ditsiano-** va x.k. perefiks qo'llanilladi: $CH_3C{\equiv}N$ tsianometan, $CH_3CH_2CH_2C{\equiv}N$ tsianopropan.

$N{\equiv}C(CH_2)_4C{\equiv}N$ geksandinitril.

$N{\equiv}CCH_2COOH$ tsianosirka kislota

Izotsianidlar (izonitrillar)

Bu birikmalarni nomlashda radikal nomiga **–izotsianid** suffiksi qo'shilib nomlanadi: $CH_3CH_2N^+{\equiv}C^-$ etilizotsianid.

Bu birikmalarni **izotsiano-** perefiksini qo'llansaxam nomlash mumkin: $CH_3CH_2N^+{\equiv}C^-$ izotsianoetan.

Kislota gidrazidi

Bu birikmalarni nomlashda **–gidrazid** suffiksidan foydalansa xam bo'ladi: $CH_3CH_2C(O)NHNH_2$ propiongidrazid.

Agar u bir asosli karbon kislota xosilasi bo'lsa uni ya'na – **karbogidrazid** suffiksini ishlatgan xolda nomlash mumkin: $CH_3CH_2C(O)NHNH_2$ etankarbogidrazid.

Kislota azidlari

Bu birikmalar karbon kislota, gidroksil guruhi azidoguruh $-N{=}N^+{=}N^-$ ga almashingan xosilasi xisoblanib, **–azid** suffiksini qo'llab nomlaymiz: $CH_3CH_2C(O)N{=}N^+{=}N^-$ propanoilazid.

Peroksikislotalar (kislota gidroperoksidlari)

Tarkibida –COOOH guruh saqlagan birikmalar **peroksikislotalar** xisoblanadi. CH_3CH_2COOOH peroksipropan kislota yoki peroksietankarbon kislota.

Ikki asosli kislota galogenangidridi.

$ClOC(CH_2)_5COCl$ geptandioildixlorid.

$CH_3OOC(CH_2)_5COCl$ metil-6-xlorformilgeksanoat.

Gidroksikarbon (oksikarbon) kislotalar

Tarkibida xam karboksil xam gidroksil guruh saqlagan uglevodorodlar girdoksikarbon kislotalar xisoblanadi.

Birikma tuzilish Formulasi	Nomlanishi	
	Trivial	sistematik
Bir asosli ikki atomli kislota		
CH_2COOH OH	Glikol kislota	Gidroksietan kislota
$CH_3CHCOOH$ OH	Sut kislota	2-gidroksipropan kislota
CH_2CH_2COOH OH	β-oksipropion kislota	3-gidroksipropan kislota
$CH_2(CH_2)_2COOH$ OH	γ-oksimoy kislota	4-gidroksibutan kislota
Bir asosli uch atomli kislota		
$CH_2CHCOOH$ $OH\ OH$	Gliserin kislota	2,3-digidroksipropan kislota
Ikki asosli uch atomli kislota		
$HOOCCHCOOH$ OH	Tartron kislota	Gidroksipropan dikislota
$HOOCCHCH_2COOH$ OH	Olma kislota	Gidroksibutan dikislota
Ikki asosli to'rt atomli kislota		
OH $HOOCCHCHCOOH$ OH	Uzum kislota	2,3-digidroksibutan dikislota
Uch asosli to'rt atomli kislota		
$COOH$ $HOOCCH_2CCH_2COOH$ OH	Limon kislota	3-gidroksi-3-karboksi-1,5-pentan dikislota

Oksokarbon kislotalar

Tarkibida xam karboksil xam karbonil guruh saqlagan birikmalar girdoksikarbon kislotalar xisoblanadi.

Birikmaning tuzilish formulasi	Nomlanishi	
	trivial	Sistematik
$\underset{\underset{O}{\|}}{C}HCOOH$	Glioksal kislota	2-oksosirka kislota
$\underset{\underset{O}{\|}}{C}HCH_2COOH$	Formilsirka kislota	3-oksopropion kislota
$CH_3\underset{\underset{O}{\|}}{C}COOH$	Pirouzum kislota	2-oksopropion kislota
$CH_3\underset{\underset{O}{\|}}{C}CH_2COOH$	Atsetosirka kislota	3-oksomoy kislota
$CH_3\underset{\underset{O}{\|}}{C}(CH_2)_2COOH$	Levulin kislota	4-oksovalerian kislota 4-oksopentan kislota
$HOOC\underset{\underset{O}{\|}}{C}COOH$	Mezoksalev kislota	2-oksopropan dikislota
$HOOC\underset{\underset{O}{\|}}{C}CH_2COOH$	Qahrabosirka kislota	2-oksobutan dikislota

Oksokarbon kislotalarning **atsil** radikalini nomlashda trivial nomenklaturadan foydalaniladi.

$O{=}CHCO\text{-}$ glioksiloil

$HOOCC(O)CO\text{-}$ mezoksaloil

$CH_3C(O)CO\text{-}$ piruvoil

$\text{-}OCCH_2C(O)CO\text{-}$ oksalatsetil

$\text{-}OCC(O)CO\text{-}$ mezoksalil

$CH_3C(O)CH_2CO\text{-}$ atsetoatsetil

Misollar.

1. Butan kislotaning barcha izomerlarini yozing va turli nomenklaturada nomlang.

Yechish:

Butan kislotada faqat 2 ta zanjir izomeriyasi mavjud.

$CH_3\text{-}CH_2\text{-}CH_2\text{-}COOH$	$CH_3\text{-}\overset{\overset{CH_3}{\vert}}{C}H\text{–}COOH$
butan kislota etilsirka kislota	izobutan kislota dimetilsirka kislota

2. Izopropilsirka kislotaning tuzilish formulalarini yozing va sistematik nomenklaturada nomlang.

Yechish:

$$
\begin{array}{l}
\quad\;\; CH_3 \\
\quad\;\;\; | \\
\overset{4}{C}H_3-\overset{3}{C}H-\overset{2}{C}H_2-\overset{1}{C}OOH
\end{array}
$$

3-metilbutan kislota

Topshiriqlar.

1. Geksaning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.
2. $C_5H_{11}Cl$ ning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.
3. $C_5H_{11}OH$ ning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.
4. 2-metoksi-3-metilbutaning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.
5. Valerian aldegidning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.
6. Kapron kislotaning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.
7. Pimelin kislotaning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.
8. Levulin kislotaning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.
9. 4-gidroksibutan kislotaning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.
10. Kislota azidning barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang.

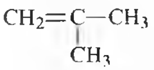
III. To'yinmagan organik birikmalarni nomlash.

III.1. Alkenlar
Trivial nomenklatura

$CH_2=CH_2$	Etilen
$CH_2=CH_2-CH_3$	Propilen
$CH_2=CH_2-CH_2-CH_3$	α-Butilen
$CH_3-CH=CH-CH_3$	β-Butilen
$CH_2=C-CH_3$ | CH_3	Izobutilen
$CH_2=CH_2-CH_2-CH_2-CH_3$	α-Amilen
$CH_3-CH=CH-CH_2-CH_3$	β-Amilen
$CH_2=C=CH_2$	Allen

Ratsional nomenklatura

Ratsional nomenklatura bo'yicha alkenlarni nomlashda etilen molekulasi nomi asos qilib olinadi. Etilendagi radikallarni biz grek xarfi bilan, agar radikallar bir tomonda yoki turli tomonda bo'lsa **simm.** yoki **nosimm.** old qo'shimcha bilan ko'rsatiladi.



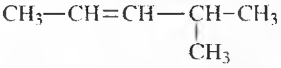
α,α-dimetil etilen

(nosim.dimetil etilen)

$CH_3-CH=CH-CH_3$

α,β-dimetil etilen

(sim.dimetil etilen)



α-metil-β-izopropil etilen

(sim.metilizopropil etilen)

Sistematik nomenklatura

Eng uzun uglerod zanjiri tanlab olinadi va uglerod atomlari qo'sh-bog' yaqin tomondan raqamlanadi. Alkanlardagi ohirgi **-an** qo'shimchasini **–en** ga o'zgartiriladi. Agar birikma ikki va undan ortiq qo'sh-bog' saqlasa unda **–adien** (alkadien), **-atrien** (alkatrien) va h.k. kabi suffikslar ishlatiladi.

$\overset{4}{C}H_3-\overset{3}{C}H_2-\overset{2}{C}H=\overset{1}{C}H_2$ — buten-1

$\overset{1}{C}H_3-\overset{2}{C}H=\overset{3}{C}H-\overset{4}{C}H_3$ — buten-2

$\overset{1}{C}H_3-\overset{2}{C}H=\overset{3}{C}H-\overset{4}{C}(CH_3)(\underset{5}{C}H_2-\underset{6}{C}H_3)-CH_3$ — 4,4-dimetilgeksen-2

$CH_3-CH_2-\overset{2}{C}(=\overset{1}{C}H_2)-\overset{3}{C}H_2-\overset{4}{C}H(CH_3)-\overset{5}{C}H_3$

2-etil-4-metilpenten-1

$\overset{1}{C}H_3-\overset{2}{C}H=\overset{3}{C}H-\overset{4}{C}H=\overset{5}{C}H-\overset{6}{C}H_2-\overset{7}{C}H_3$

2,4-geptadien

Radikal xolda kelgan bitta qo‘shbog‘li uglevodorod radikalini nomlashda –**enil**, ikkita qo‘shbog‘li uglevodorod radikalini nomlashda – **dienil** suffiksidan foydalaniladi. Radikallarni raqamlashda ochiq valentli uglerodga 1 raqamini qo‘yib raqamlanadi.

$H_3\overset{3}{C}-\overset{2}{C}H=\overset{1}{C}H-$	$\overset{4}{C}H_3-\overset{3}{C}H=\overset{2}{C}H-\overset{1}{C}H_2-$	$\overset{4}{C}H_2=\overset{3}{C}H-\overset{2}{C}H=\overset{1}{C}H-$
1-propenil	2-butenil	1,3-butadienil
$CH_2=CH-$	$CH_2=CH-CH_2-$	$CH_3-\underset{\vert}{C}=CH_2$
vinil	allil	izopropenil

Ikki valentli radikal bo‘lsa, unda radikal nomiga **en** qo‘shiladi (**-enilen, -dienilen**).

$-\overset{5}{C}H_2-\overset{4}{C}H(CH_2CH_2CH_3)-H\overset{3}{C}=\overset{2}{C}H-\overset{1}{C}H_2-$

4-propil-2-pentenilen

$-CH_2CH=CH-$	$-CH_2-CH=CH-CH_2CH_2-$
propenilen	2-pentenilen

Misollar.

1. Butenning barcha izomerlarini yozing va sistematik nomenklaturada nomlang.

Yechish:

$CH_2{=}CH{-}CH_2{-}CH_3$ — buten-1

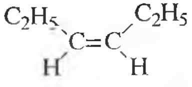
$CH_3{-}CH{=}CH{-}CH_3$ — buten-2

$CH_3{-}\underset{}{\overset{CH_3}{\overset{|}{C}}}{=}CH_2$ — 2-metilpropen

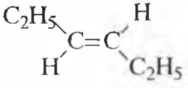
2. sim.Dietil etilenning tuzilish formulasini yozing.

Yechish:

$$C_2H_5{-}CH{=}CH{-}C_2H_5$$



Z- yoki sis-izomeri



E- yoki trans- izomeri

Topshiriqlar.

1. Geksening barcha izomerlari formulalarini yozing va turli nomenklaturada nomlang. Geometrik izomerlarini sis- trans va Z, E-nomenklaturada nomlang.

2. Geptadienning struktura va fazoviy tuzilish formulalarini yozing va nomlang.

III.2. Alkinlar.

Ratsional nomenklatura

Ratsional nomenklatura bo‘yicha alkinlarni nomlashda asetilen nomi asos qilib olinadi.

$HC{\equiv}C{-}CH_2{-}CH_3$ — etilasetilen

$CH_3{-}C{\equiv}C{-}CH_3$ — dimetilasetilen

Sistematik nomenklatura

Eng uzun uglerod zanjiri tanlab olinadi va uglerod atomlari uchbog‘ yaqin tomondan raqamlanadi. Alkanlardagi ohirgi **-an** qo‘shimchasi **–in** ga o‘zgaradi. Agar ikki va undan ortiq uchbog‘ saqlasa unda **–adiin** (alkadien), **-atriin** (alkatrien) va h.k. kabi suffikslar ishlatiladi.

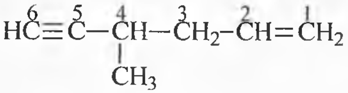
$\overset{1}{H}\overset{}{C}{\equiv}\overset{2}{C}{-}\overset{3}{C}H_2{-}\overset{4}{C}H_3$ — butin-1

$\overset{1}{C}H_3{-}\overset{2}{C}{\equiv}\overset{3}{C}{-}\overset{4}{C}H_3$ — butin-2

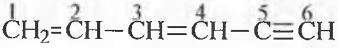
$$\overset{1}{C}H_3{-}\overset{2}{C}{\equiv}\overset{3}{C}{-}\overset{4}{C}{\equiv}\overset{5}{C}{-}\overset{6}{C}H_2{-}\overset{7}{C}H_3$$

2,4-geptadiin

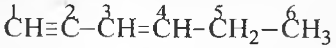
Uglerod zanjirlarida ham qo'shbog', ham uchbog' mavjud **bo'lganda** uglerod atomlarini raqamlash bog' yaqin tomonidan raqamlanadi. Agar raqamlashda tanlash imkoni bo'lsa ham, u qo'sh bog' yaqin tomondan boshlab raqamlanadi. Xar ikkala xolda xam oldin qo'sh bog' saqlagan uglerod atomi ko'rsatiladi.



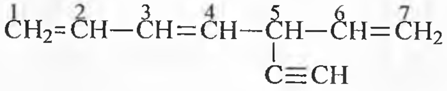
4-metilgeksen-1-in-5



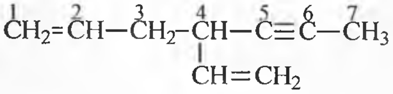
geksadien-1,3-in-5



geksen-3-in-1



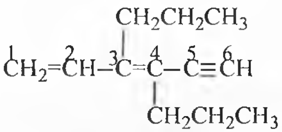
5-etinil-1,3,6-geptatrien,
5-vinilgeptadien-1,3-in-6



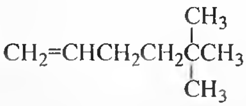
4-vinilgepten-1-in-5

Tarmoqlangan to'yinmagan atsiklik uglevodorodlar – bu birikmalar o'zida eng ko'p qo'sh va uch bog'larga ega bo'lgan tarmoqlanmagan uglevodorodlarning xosilalari sifatida qaraladi.

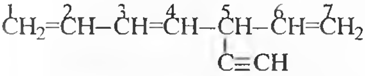
Agar eng ko'p karrali bog'lari bo'lgan uglerod zanjiri bir nechta bo'lsa, eng uzun uglerod zanjirlari tanlab olinadi. Bunday uzun uglerod zanjirlari bir nechta bo'lsa, qo'sh bo'i ko'p bo'lgan zanjir tanlanadi.



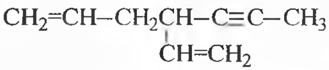
3,4-dipropil-1,3-geksadien-5-in



5,5-dimetil-1-geksen



5-etinil-1,3,6-geptatrien



4-vinil-1-gepten-5-in

Radikal xolda kelgan uchbog‘li uglevodorod radikalini nomlashda – **inil**, ikkita uchbog‘li uglevodorod radikalini nomlashda **–diinil** suffiksidan foydalaniladi. Radikallarni raqamlashda ochiq valentli ugledorga 1 raqamini qo‘yib raqamlanadi.

$H\overset{2}{C}\equiv\overset{1}{C}-$	$H\overset{3}{C}\equiv\overset{2}{C}-\overset{1}{C}H_2-$	$H\overset{5}{C}\equiv\overset{4}{C}-\overset{3}{C}H=\overset{2}{C}H-\overset{1}{C}H_2-$
etinil	2-propinil	2-penten-4-inil

Misollar.

1. Butinining barcha izomerlarini yozing va sistematik nomenklaturada nomlang.

Yechish:

$HC\equiv C-CH_2-CH_3$	$CH_3-C\equiv C-CH_3$
butin-1	butin-2

2. Geksen-3-in-1ning tuzilish formulalarini yozing.

Yechish:

$\overset{1}{C}H\equiv\overset{2}{C}-\overset{3}{C}H=\overset{4}{C}H-\overset{5}{C}H_2-\overset{6}{C}H_3$

Topshiriqlar.

1. Geptining barcha izomerlari formulalarini yozing va xar xil nomenklaturada nomlang.
2. Tarkibida 1 ta qo‘sh bog‘, 1 ta uch bog‘ bo‘lgan 7 ta uglerodli uglevodorodlarning tuzilish formulalarini yozing va nomlang.

III.3. Galogenli birikmalar.

Ratsional nomenklatura

To'yinmagan galogen birikmalarni *radikal-funksional* nomenklaturada nomlashda 1-jadvaldan foydalaniladi.

$CH_2{=}CH{-}CH_2{-}Cl$	$CH_3{-}CH{=}CH{-}Cl$	$CH_2{=}C(Cl){-}CH_3$
propen-2-il-1xlorid, allilxlorid	propen-1-il-1xlorid	izopropenilxlorid

Sistematik nomenklatura

Sistematik nomenklatura bo'yicha nomlashda uglerod zanjiri qo'shbog' yoki uchbog' tomondan yoki unga yaqin joydan raqamlanadi.

$\overset{1}{C}H_2{=}\overset{2}{C}H{-}\overset{3}{C}H_2{-}\overset{4}{C}H_2Cl$	$\overset{4}{C}H_3{-}\overset{3}{C}H_2{-}\overset{2}{C}H{=}\overset{1}{C}HCl$
4-xlorbuten-1	1-xlorbuten-1

III.4. Spirtlar

To'yinmagan spirtlarni ratsional nomenklaturada nomlashda xam 1-jadvaldan foydalaniladi.

Spirtlarni sistematik nomenklaturada nomlashda uglerod zanjirini OH-funksional guruxi yaqin tomondan raqamlanadi.

$\overset{4}{C}H_2{=}\overset{3}{C}H{-}\overset{2}{C}H_2{-}\overset{1}{C}H_2OH$	$\overset{4}{C}H_2{=}\overset{3}{C}H{-}\overset{2}{C}H(OH){-}\overset{1}{C}H_3$
buten-3-ol-1	buten-3-ol-2

III.5. Oddiy efirlar

$CH_3CH_2OCH{=}CH_2$

etoksietilen

viniletil efir

$CH_2{=}CH{-}CH_2{-}O{-}CH_2{-}CH_2{-}CH_3$

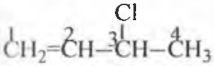
Alliloksipropan,

allilpropil efir

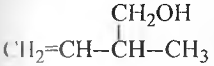
Misollar.

1. 3-xlorbuten-1ning tuzilish formulasini yozing.

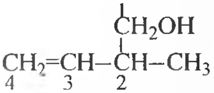
Yechish:



2. Quyidagi moddani sistematik nomenklatura bo'yicha nomlang.



Yechish:



2-metilbuten-3-ol-1

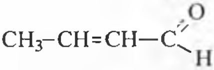
Topshiriqlar.

1. Allilpropil efirning barcha izomerlari formulalarini yozing va nomlang.

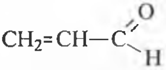
2. Tarkibida 5 ta uglerod, 1 ta qo'sh bog' va 1 ta brom bo'lgan birikma formulalarini yozing va nomlang.

III.6. Aldegid va ketonlar.

Trivial nomenklatura



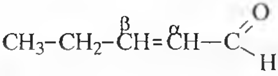
Kroton aldegid



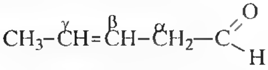
Akrolein

Ratsional nomenklatura

Ratsional nomenklatura bo'yicha nomlashda qo'shbog' yoki uchbog' joylashgan uglerodlar orasi grek harfi bilan ko'rsatiladi.



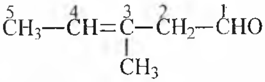
α-propilidensirkaaldegid



β-etilidenpropionaldegid

Sistematik nomenklatura

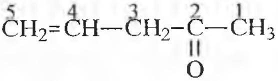
Sistematik nomenklaturada nomlashda raqamlash karbonil gurux tomondan boshlanadi.



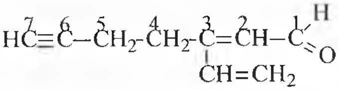
3-metilpenten-3-al

O‘zak – **pent-**, to‘yinmaganlik darajasi – **en**, bosh (asosiy) funksional guruh qo‘shimchasi **–al**, yon zanjirdagi guruh **–3–metil**.

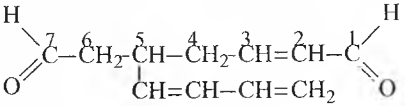
To‘liq nomi **3-metil-penten-3-al.**



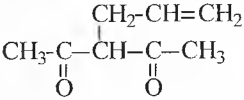
penten-4-on-2



3-vinil-2-gepten-6-inal



5-(1,3-butadienil)-2-geptendial

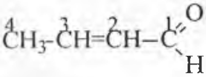


3-allil-2,4-pentandion

Misollar.

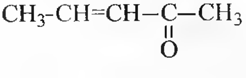
1. Kroton aldegidni sistematik nomenklaturada nomlang.

Yechish:

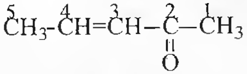


buten-2-al

2. Quyidagi moddani sistematik nomenklatura bo‘yicha nomlang.



Yechish:



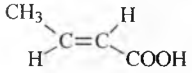
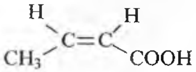
penten-3-on-2

Topshiriqlar.

1. 2-metilpenten-3-alning barcha izomerlari formulalarini yozing va nomlang.

2. Tarkibida 6 ta uglerod atomi bo‘lgan etilen qatori ketonlarining formulalarini yozing va nomlang.

III.7. Karbon kislotalar

Formulasi	To‘yinmagan **karbon kislotaning nomlanishi**	
	Trivial nomenklatura	**O‘rinbosarli nomenklatura**
$CH_2=CH–COOH$	Akril kislota	Propen kislota
$CH_2=C(CH_3)–COOH$	Metakril kislota	2-metilpropen kislota
$CH_2=CH–CH_2–COOH$	Vinilsirka kislota	Buten-3 kislota
	Kroton kislota	trans-buten-2 kislota
	Izokroton kislota	sis-buten-2 kislota
$HC\equiv C–COOH$	Propiol kislota	Propin kislota
$CH_3–C\equiv C–COOH$	Tetrol kislota	Butin-2 kislota

Ratsional nomenklatura

Ratsional nomenklatura bo‘yicha nomlashda qo‘shbog‘ yoki uchbog‘ joylashgan uglerodlar orasi grek harfi bilan ko‘rsatiladi.

$\overset{\gamma}{C}H_3–\overset{\beta}{C}H=\overset{\alpha}{C}H–COOH$ — α-etilidensirka kislota

$\overset{\gamma}{C}H_2=\overset{\beta}{C}H–\overset{\alpha}{C}H_2–COOH$ — α-vinilsirka kislota

Bir asosli to‘yinmagan karbon kislota atsil radikali

Radikalning tuzilish formulasi	**Nomlanishi**	
	trivial	**sistematik**
$H_2C=CHCO-$	Akroil	Propenoil

$H_2C=C-CO-$ $\quad\quad\;\, \vert$ $\quad\quad CH_3$	Metakriol	2-metilpropenoil
$H_3C \quad\quad\; H$ $\quad C=C$ $H \quad\quad\;\; CO-$	Krotonoil	Trans-2-butenoil
$H \quad\quad\;\; H$ $\quad C=C$ $H_3C \quad\; CO-$	Izokrotonoil	Sis-2-butenoil
$H_3C(CH_2)_7-CH$ $\quad\quad\quad\quad\quad \Vert$ $-OC(CH_2)_7-CH$	Oleil	Sis-9-oktadetsenoil

To'yinmagan ikki asosli karbon kislotalar

Formulasi	Nomlanishi	
	Trivial nomenklatura	O'rinbosarli nomenklatura
$HOOC-CH$ $\quad\quad\;\; \Vert$ $HOOC-CH$	Malein kislota	Tsis-butendi kislota
$HC-COOH$ $\Vert$ $HOOC-CH$	Fumar kislota	Trans-butendi kislota
$HOOC-C-CH_3$ $\quad\quad\;\; \Vert$ $HOOC-CH$	Mezakon kislota	Tsis-metilbutendi kislota
$HOOC-C-CH_3$ $\quad\quad\;\; \Vert$ $HC-COOH$	Tsitrakon kislota	Trans-metilbutendi kislota

Ikki asosli to'yinmagan karbon kislota atsil radikali

Radikalning tuzilish formulasi	Nomlanishi	
	trivial (ratsional)	sistematik
$-OC-CH$ $\quad\quad\;\; \Vert$ $-OC-CH$	Maleoil	Tsis-butendioil
$HC-CO-$ $\Vert$ $-OC-CH$	Fumaroil	Trans-butendioil
$-OC-C-CH_3$ $\quad\quad\;\; \Vert$ $-OC-CH$	Mezakonoil	Tsis-metilbutendioil
$-OC-C-CH_3$ $\quad\quad\;\; \Vert$ $HC-CO-$	Tsitrakonoil	Trans-metilbutendioil

Misollar.

1. Penten-1ning barcha izomerlar formulalarini yozing va ratsional nomenklatura bo‘yicha nomlang.

Yechish:

$CH_2=CH-CH_2-CH_2-CH_3$ — penten-1, propiletilen

$CH_3-CH=CH-CH_2-CH_3$ — penten-2, α-metil-β-etiletilen

$\quad CH_3$
$CH_2=C-CH_2-CH_3$

2-metilbuten-1, α-metil-α-etiletilen

$\qquad\qquad\quad CH_3$
$CH_2=CH-CH-CH_3$

3-metilbuten-1, izopropiletilen

$\qquad\qquad\quad CH_3$
$CH_3-CH=C-CH_3$

2-metilbuten-2, α,α, β,-trimetiletilen

2. 3-metilbuten-2 kislotani tuzilish formulasini yozing.

Yechish:

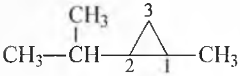
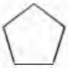
$\qquad CH_3$
$CH_3-C=CH-COOH$

Topshiriqlar.

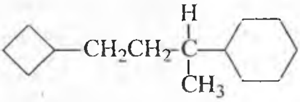
1. 4,5-dimetilgeksen-2 ning barcha izomerlari formulalarini yozing va nomlang.
2. 4-metilgeksen-1-in-5 ning barcha izomerlari formulalarini yozing va nomlang.
3. 3-xlorbuten-1 ning barcha izomerlari formulalarini yozing va nomlang.
4. Penten-4-ol-1 ning barcha izomerlari formulalarini yozing va nomlang.
5. Pentoksietilenning barcha izomerlari formulalarini yozing va nomlang.
6. 2-metilpenten-3-al ning barcha izomerlari formulalarini yozing va nomlang.

IV. Sikloalkanlar, ansambllar, spiranlar, ko‘priksimon sikloalkanlar, terpenlar.

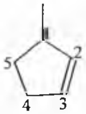
IV.1. Alisiklik uglevodorodlar

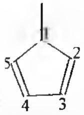
siklopropan 1-metil-2-izopropilsiklopropan siklopentan



1-siklobutil-3-siklogeksilbutan

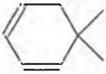


2-siklopenten-1-il

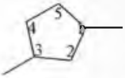


2,4-siklopentadien-1-il

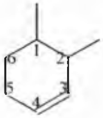
Siklopentiliden



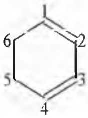
2,4-siklogeksadien-1-iliden



1,3-siklopentilen

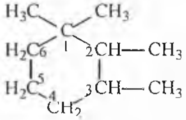


3-siklogeksen-1,2-ilen

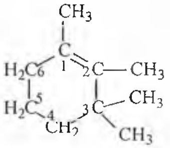


siklogeksadien-1,3

Tetrametilsiklogeksan tipidagi uglevodorodlar. Bu tipdagi monosiklik terpen uglevodorodlari siklogeksan, siklogeksen va siklogeksadien hosilalari sifatida nomlanadi:



1,1,2,3-tetrametil-siklogeksan



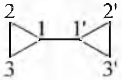
1,2,3,3-tetrametil-siklogeksen-1

IV.2. Xalqalari bir-biri bilan bog'langan bisiklik birikmalar (ansamblli xalqalar)

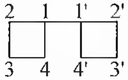
Bunday birikmalardagi uglerod atomlari har bir xalqa uchun, xalqalar bog'langan uglerod atomidan boshlab aloxida raqamlanadi. Ikkinchi xalqadagi uglerod atomlari shtrixli raqamlar bilan raqamlanadi.

Xalqalar bir xil bo'lsa xalqa radikali oldiga bi- old qo'shimchasi qo'shiladi.

Masalan:



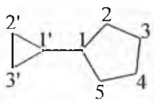
1,1'-bisiklopropil



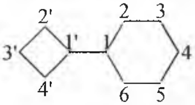
1,1'-bisiklobutil

Xalqalar bir xil bo'lmasa kichik xalqa katta xalqaning o'rinbosari sifatida olinadi. Asosiy xalqa sifatida katta xalqa olinadi va uglerod atomlari xalqalar bog'langan uglerod atomlaridan boshlab raqamlanadi, kichik xalqa uglerod atomlari shtrixli raqamlar bilan raqamlanadi.

Masalan:



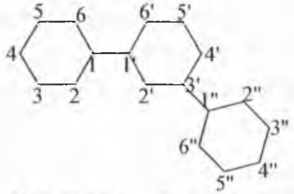
1-tsiklopropilsiklopentan



1-tsiklobutilsiklogeksan

Bir-biriga bog'langan xalqalar ko'p bo'lsa, uchta xalqa uchun **ter-**, to'rtta xalqa uchun **kvater-**, beshta xalqa uchun **kvinki-**, oltita xalqa uchun **seksi-**, yettita xalqa uchun **septi-**, sakkizta xalqa uchun **okti-**, to'qqizta xalqa uchun **noni-**, o'nta xalqa uchun **detsi-** old qo'shimchalar ishlatiladi.

Masalan:

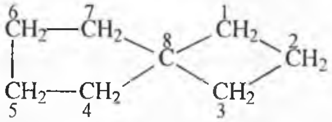


1,1':3',1"-tersiklogeksan

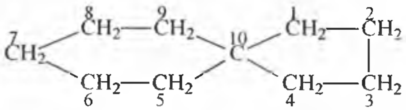
IV.3. Spiranlar

Spirobog‘ ikkita xalqa uchun umumiy, yagona bo‘lgan uglerod atomi bilan hosil bo‘ladi. Bu umumiy atom spiro atom deyiladi. Spiro atomlarning soniga qarab monospiro-, uchspiro- va x.k. birikmalar bo‘ladi. Spirouglevodorodlarni ikki xil usul bilan nomlash mumkin.

1. Monospirouglevodorodlar (bitta spiro atom tutuvchi) xuddi shuncha uglerod atomlari bo‘lgan alkan nomining oldiga spiro- so‘zi qo‘shiladi. O‘rta qavslarda kattalashib boruvchi raqamlar bilan har bir xalqadagi spiro atom bilan bog‘langan uglerod atomlarining soni ko‘rsatiladi, bunda qavs spiro- so‘zi va uglevodorod nomining o‘rtasiga qo‘yiladi. Spiro sistemadagi uglerod atomlarini raqamlash kichik xalqadan boshlanib markazdagi spiro atomi bilan tugaydi.



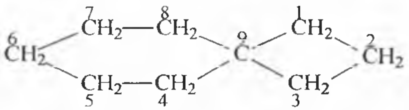
spiro[3.4]oktan



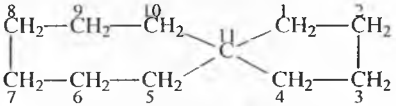
spiro[4.5]dekan

2. Agar spirobog‘ bilan ikkita turli (bir xil bo‘lmagan) xalqalar bog‘langan bo‘lsa spiro birikmaning nomida avval katta xalqaning keyin kichik xalqaning nomi keltiriladi.

Misol:



siklogeksanspirosiklobutan;
spiro[3.5]nonan



siklogeptanspirosiklopentan;
spiro[4.6]undekan

IV.4. Ko'priksimon sikloalkanlar

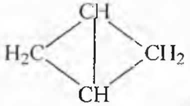
Ko'priksimon alisiklik uglevodorodlarga tarkibida molekula turli qismlarini bog'lab turuvchi "ko'prik" – valent bog', atom yoki tarmoqlanmagan uglerod atomlarining zanjiri bo'lgan bi-, tri- va polisiklik uglevodorodlar kiradi. Ko'prik orqali bog'langan ikkita uchlamchi uglerod atomlari xalqalarni bog'lovchi atomlar deyiladi.

Ko'priksimon bisiklik strukturalar Bayer sistemasi bo'yicha nomlanadi.

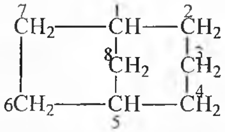
1. To'yingan ko'priksimon bisiklik uglevodorodlar shunday sondagi uglerod atomlari bo'lgan alkanlarning hosilalari sifatida qaraladi. Alkanning nomi oldiga bisiklo- so'zi qo'shilib o'rta qavs ichiga shifr qo'yiladi. Shifrdagi sonlar kichrayib borish tartibida ikkita uchlamchi uglerod atomlari bilan bog'langan uchta har-bir ko'prik xalqasidagi uglerod atomlari sonini ko'rsatadi.

Sistema uglerod atomlari birinch bo'g'in atomidan boshlab eng uzun yo'l bilan ikkinchi bo'g'in atomiga, keyin birinchi bo'g'indan qisqaroq yo'l bilan va nixoyat eng qisqa yo'l bilan raqamlanadi.

Misol:

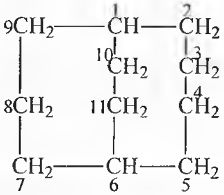


bisiklo[1.1.0]butan



bisiklo[3.2.1]oktan

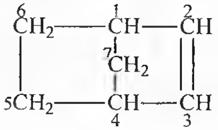
Keyingi misolda xalqa uglerod atomlarini raqamlashdagi eng uzun yo‘l-1,2,3,4,5, qisqaroq yo‘l-5,6,7,1 va eng qisqa yo‘l -1,8,5.



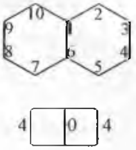
bisiklo[4.3.2]undekan

Eng uzun yo‘l-1,2,3,4,5,6, qisqaroq yo‘l-6,7,8,9,1 va eng qisqa yo‘l-1,10,11,6.

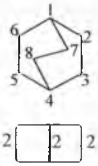
2. Ko‘priksimon uglevodorodlar sikloalkanlar va to‘yinmagan monosiklik uglevodorodlar uchun bayon qilingan tartibga binoan nomlanadi. Agar raqamlashda tanlash mumkin bo‘lgan xollarda eng kichik raqam karrali (ya’ni qo‘sh yoki uchbogv saqlagan) bog‘li uglerod atomiga beriladi.



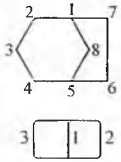
bisiklo[2.2.1]gepten-2



bitsiklo-[4,4,0]-dekan



bitsiklo-[2,2,2]-oktan



bitsiklo-[3,2,1]-oktan

Bisiklik sistema turi

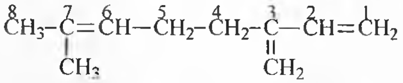
Umumiy sikl uglerod atomi miqdori	Sistema tipi
0	Xalqalari bir-biri bilan bog‘langan bitsiklik birikmalar (ansamblli xalqa)
1	Spirouglevodorodlar, spiroalkanlar (spiranlar)
2	Kondensirlangan xalqali bisiklik sistema
3 va ko‘rop	Ko‘priksimon siklik sistema

IV.5. Terpenlar

Terpenlar IYuPAK nomenklaturasi qoidalarida ilgaridan qabul qilingan qoidalarga muvofiq aloxida nomlanadi.

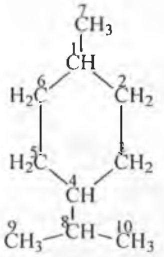
Atsiklik terpenlar. Atsiklik terpen uglevodorodlari boshqa to‘yinmagan atsiklik uglevodorodlar uchun qabul qilingan qoidalar bo‘yicha nomlanadi.

Misol:

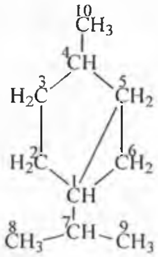


7-metil-3-metilen-1,6-oktadien

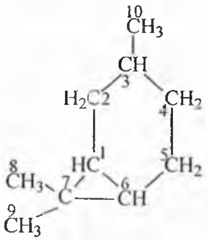
Tsiklik terpenlar. Monotsiklik va bitsiklik terpenlarning maxsus nomenklaturasiga quyida keltirilgan struktura turlari asos qilib olingan. Bunda formulalar, maxsus nomlar va raqamlash qoidalari berilgan. Kamfan va bornilan nomlar o‘rniga bornan nomi kiritilgan. Terpenlarning asosiy turlari va uglerod atomlarini nomerlash tartibi:



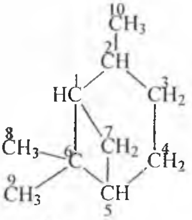
mentan



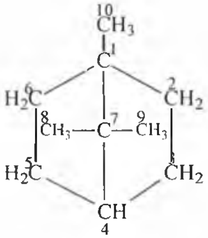
tuyan



karan



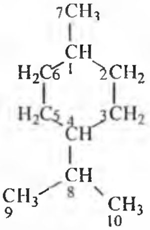
pinan



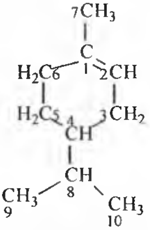
bornan

Monotsiklik terpenlar. Mentan turi. Bu turdagi monosiklik uglevodorodlarni (orto-, meta- va para- izomerlar) mentan, menten, mentadien va x.k. deb nomlanadi va mentan uchun qabul qilingan tartibda raqamlanadi. Bu uglevodorodlarning hosilalari yuqorida keltirilgan qoidalarga muvofiq nomlanadi.

Misol:

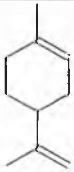


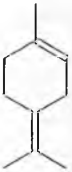
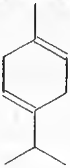
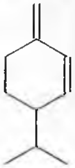
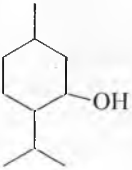
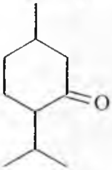
p-mentan



p-menten-1

Terpenlarning ratsional va trivial (qavsda) nomlanishiga misollar

Terpenning tuzilish formulasi	Nomlanishi	Terpenning tuzilish formulasi	Nomlanishi
	1-menten		1,8-mentadien $\Delta^{1,8}$-mentadien (limonen)

	1,3-mentadien $\Delta^{1,3}$-mentadien (α-terpinen)		1,4(8)-mentadien $\Delta^{1,4(8)}$-mentadien (terpinolen)
	1(7),3-mentadien $\Delta^{1(7),3}$-mentadien (β-terpinen)		1,5-mentadien $\Delta^{1,5}$-mentadien (α-fellandren)
	1,4(5)-mentadien $\Delta^{1,4(5)}$-mentadien (γ-terpinen)		1(7),2-mentadien $\Delta^{1(7),2}$-mentadien (β-fellandren)
	3-mentanol (mentol)		3-mentanon (menton)

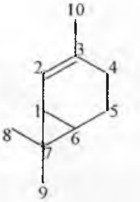
Bitsiklik terpenlar. Karan, pinan va bornan sklet formulasiga ega bo‘lgan bitsiklik terpen uglevodorodlari mos ravishda quyidagicha nomlanadi:

Karan, karen, karadien va x.k.

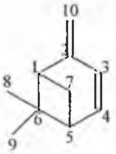
Pinan, pinen, pinadien va x.k.

Bornan, bornen, bornadien va x.k.

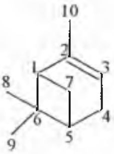
Ularning raqamlanishi yuqorida keltirilgandek.



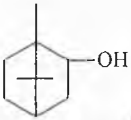
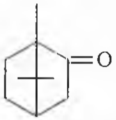
2-karen (karen-2)



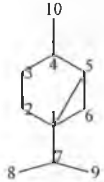
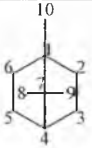
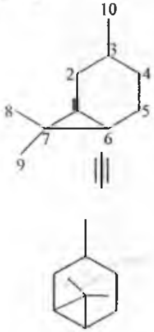
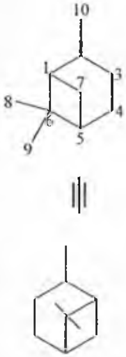
2(10),3-pinadien

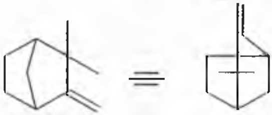


2-pinen (pinen-2)

		
2-bornen (bornen-2)	2-oksibornan	2-oksobornan (kamfora)

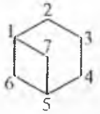
Bitsiklik terpenlarning nomlanishi

Terpenning tuzilish formulasi	Nomlanishi	Terpenning tuzilish formulasi	Nomlanishi
	Tuyan, 4-metil-1-(1-metiletil)bitsiklo-[3.1.0]-geksan		Bornan (kamfan), 1,7,7-trimetilbitsiklo-[2.2.1]-geptan
	Karan, 3,7,7-trimetil-bitsiklo-[4.1.0]-geptan		Pinan, 2,6,6-trimetilbitsiklo-[3.1.1]-geptan



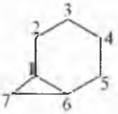
Kamfen
2,2-dimetil-3-metilbitsiklo-[2.2.1]-geptan

Agar terpen molekulasidagi xamma metil guruh, siklik skeletga bog‘langan, vodorod atomiga almashsa, ularni nomlashda terpen nomi oldiga **nor-** perefiksi ishlatiladi:



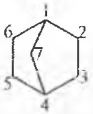
norpinan

bitsiklo-[3.1.1]-geptan



norkaran

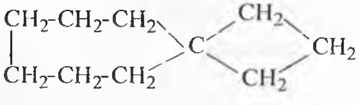
bitsiklo-[4.1.0]-geptan



norbornan

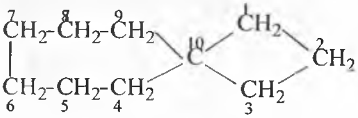
bitsiklo-[2.2.1]-geptan

Misollar.

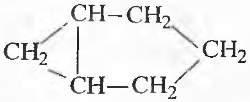
1. 

berilgan moddani nomlang.

Yechish:



spiro[3,6]dekan

2. 

berilgan moddani nomlang.

Yechish:

bitsiklo[3.1.0]geksan

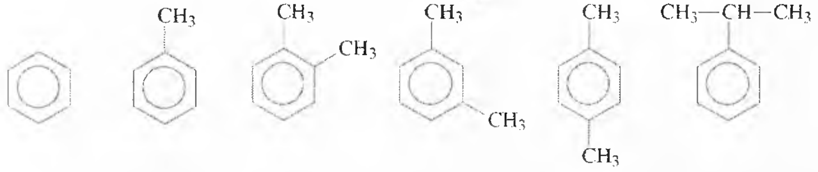
Topshiriqlar.

1. 1-metil-2-izopropiltsiklopropanning barcha izomerlari formulalarini yozing va nomlang.
2. 1,1'-bitsiklopentilning tuzilish formulasini yozing.
3. 1-tsiklopropiltsiklogeksanning tuzilish formulasini yozing.
4. Spiro[4,6]undekanning tuzilish formulasini yozing.
5. Bitsiklo[3,3,0]oktanning tuzilish formulasini yozing.

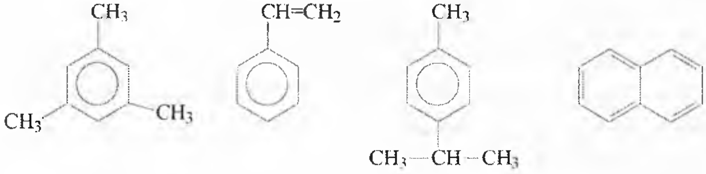
V. Aromatik uglevodorodlar

Aromatik uglevodorodlarni nomlashda ba'zilarining tarixiy nomi saqlanib qolgan:

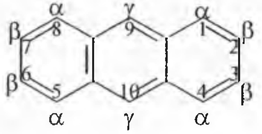
Aromatik uglevodorodlarni nomlashda ba'zilarining tarixiy nomi saqlanib qolgan:



benzol — toluol (metilbenzol) — o-ksilol — m-ksilol (m-dimetil-benzol) — p-ksilol — kumol (izopropil-benzol)



mezitilen (1,3,5-trimetilbenzol) — stirol (vinilbenzol) — p-tsimol — naftalin



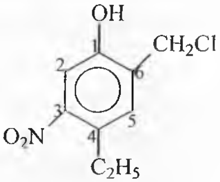
Antratsen

Xalqada bir nechta o'rinbosar bo'lsa ularni raqam bilan ko'rsatiladi yoki o-(orto-), m-(meta-) va p-(para-) ifodalar orqali nomlanadi. Aromatik uglevodorodlarni nomlashda benzolni asos qilib olish mumkin. Funksional guruxlar xar xil sinfga yoki bir xil sinfga oid bo'lishi mumkin.

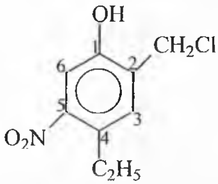
1. Benzol xalqasida har xil sinfga oid funksional guruxlar kelganda, bosh va asosiy funksional guruh uglerodi raqamlanib, bosh funksional

guruxi uglerodidan boshlab (bunda yon funksional guruxlarni katta-kichikligi inobatga olinmaydi) boshqa funksional gurux yaqin tomonga qarab raqamlanadi. Yon funksional guruxlar alfavit tartibida (qaysi tilda yozilishiga qarab) nomlanadi.

Misol:



(I) 3+4+6=13



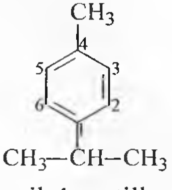
(II) 2+4+5=11

4-etil-5-nitro-2-xlormetilfenol

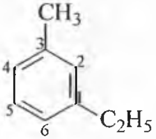
4-etil-1-gidroksi-5-nitro-2-xlormetilbenzol

(II) usulda raqamlaganimizda yig'indi son kichik bo'lgani uchun bu to'g'ri raqamlangan bo'ladi. Uning nomi 4-etil-5-nitro-2-xlormetilfenol yoki 4-etil-1-gidroksi-5-nitro-2-xlormetilbenzol bo'ladi.

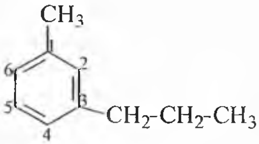
2. Benzol xalqasida bir xil sinfga oid funksional guruxlar kelganda, agar nomlashga benzol xalqasi asos qilib olinadigan bo'lsa, unda funksional guruxni (radikallarni) nomi alfavit bo'yicha (qaysi tilda yozilishiga qarab) raqamlanadi.



1-izopropil-4-metilbenzol

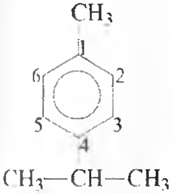


1-etil-3-metilbenzol



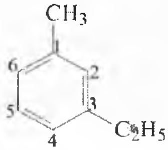
1-metil-3-propilbenzol

Nomlashga asos qilib toluol, kumol, stirol va x.k. larni ham olish mumkin.



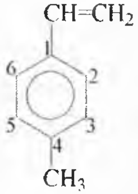
4-metilkumol

para-metilkumol



3-etiltoluol

meta-etiltoluol

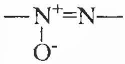
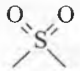
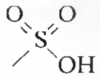


4-metilstirol

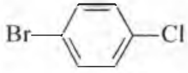
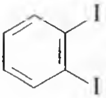
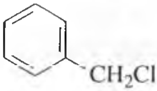
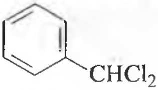
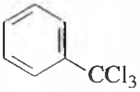
para-metilstirol

Aren xosilasining funktsional guruhlari

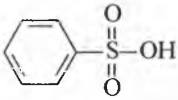
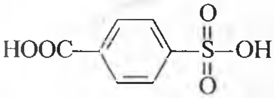
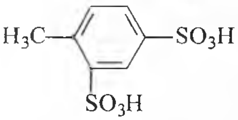
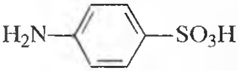
Guruh		Birikma sinfi	Nomlanishi	
Formulasi	**Nomlanishi**		**Prefiks**	**Suffiks yoki qo'shimcha**
-F	Ftor	Ftoridlar	Ftor-	-
-OH	Gidroksil	Spirtlar, fenollar	Gidroksi-	-ol
-OR	Alkoksi-	Oddiy efirlar	Metoksi-	-
-O-	Epoksi-	Okis	Epoksi-	-
>C=O	Karbonil	Aldegidlar, ketonlar	Okso-	-al -on
-COOH	Karboksil	Karbon kislota	Karboksi-	-oy kislota (karboksil yoki karbon kislota)
-COOR	Murakkab efir karbalkoksi	Murakkab efir	Karbalkoksi-	-
O=C O O=C	Angidrid	Kislota angidridi	-	...kislota angidrid
-COCl	Karbonilxlorid	Karbon kislota xlorangidridi	-	-oilxlorid (karbonil xlorid)
$-NH_2$	Amino-	Birlamchi amin	Amino-	-amin
-NH- -NHR	Imino- Alkilamino-	Ikkilamchi amin	Metilamino-	-
-NH-NH-	Gidrazo-	-	Gidrazo-	-
-N=N-	Azo-	Azobirikmalar	Azo-	-

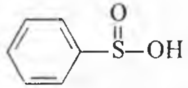
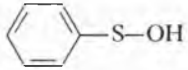
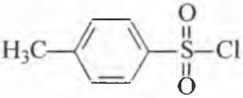
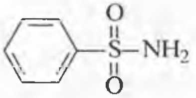
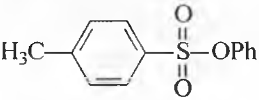
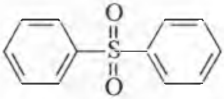
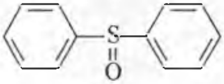
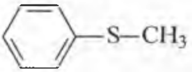
	Azoksi-	Azoksibirikmalar	Azoksi-	-
-CH=NH	Aldimino-	Aldiminlar	-	-aldimin
>C=NH	Ketimino-	Ketiminlar	-	-onimin
$-CONH_2$	Karbamoil	Karbon kislota amidlari	-	-amid (karboksamid)
-CONHR	Karbonamido-Karbonalkamid-	N-almashgan karbon kislota amidlari	-	-
$-CONR_2$	Karbondi-alkilamido	N,N-dialmashgan karbon kislota amidlari	-	-
-C≡N	Tsiano-(nitrilli)	Nitrillar (tsianidlar)	Tsiano-	-nitril
-N=O	Nitrozo-	Nitrozobirikmalar	Nitrozo-	-
$-NO_2$	Nitro-	Nitrobirikmalar	Nitro-	-
$-N^+≡N$	Diazoniy	Diazobirikmalar, diazoniy tuzlari	Diazo-	-diazoniy
-SH	Sulfidgidril	Merkaptanlar (tiospirtlar)	Merkapto-	-tiol
-SR	Alkiltio-	Sulfidlar	Metiltio-	-sulfid
>S=O	Sulfoksid	Sulfoksidlar	-	-sulfoksid
	Sulfonil	Sulfonlar	-	-sulfon
	Sulfo-	Sulfon kislota	Sulfo-	Sulfon kislota

Aromatik uglevodorodlarning galogenli xosilalari

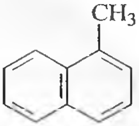
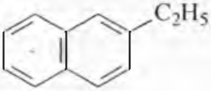
Birikma tuzilish formulasi	Nomlanishi	
	Sistematik	Alternativ
	1-brom-4-xlorbenzol	-
	1,2-diyodbenzol, o-diyodbenzol	-
	Xlormetil benzol	Benzilxlorid, α-xlorfenilmetan, α-xlortoluol
	Dixlormetil benzol	Benziliden xlorid, α,α-dixlorfenilmetan, α,α-dixlortoluol
	Trixlormetil benzol	Benzotrixlorid, α,α,α-trixlortoluol

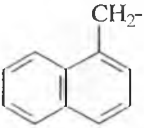
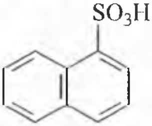
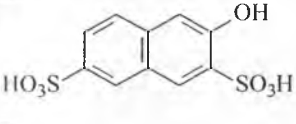
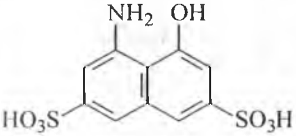
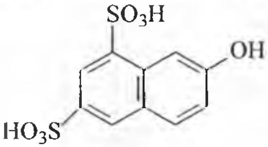
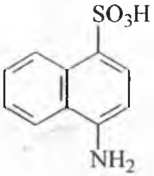
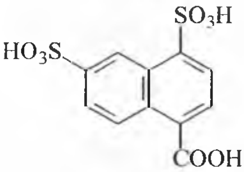
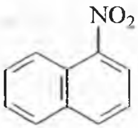
Ba'zi oltingugurt saqlagan aromatik birikmalar

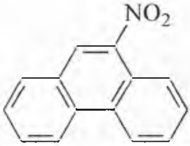
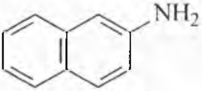
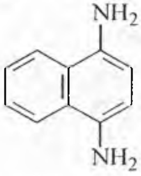
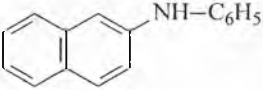
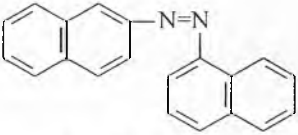
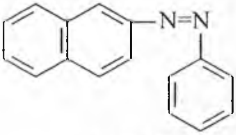
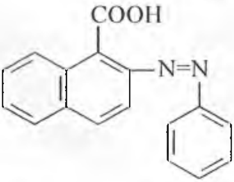
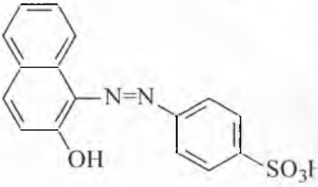
Birikmaning tuzilish formulasi	Nomlanishi	
	Sistematik	Alternativ
	Benzolsulfon kislota, benzolsulfokislota	Sulfobenzol
	4-sulfobenzoy kislota, p-sulfobenzoy kislota	4-sulfobenzol-1-karbon kislota
	Toluol-2,4-disulfon kislota, toluol-2,4-disulfokislota	4-metilbenzol-1,3-disulfokislota, 4-metilbenzol-1,3-disulfon kislota
	4-amino-benzolsulfon kislota, 4-amino-benzolsulfokislota	Sulfanil kislota, p-anilinsulfokislota

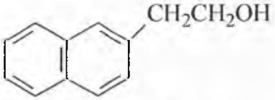
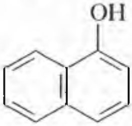
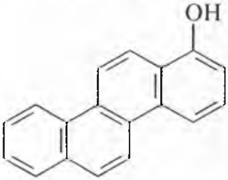
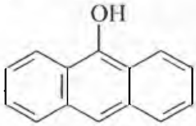
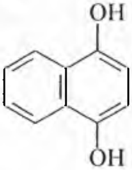
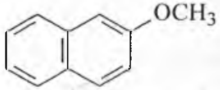
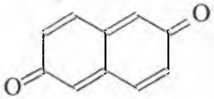
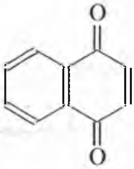
	Benzolsulfin kislota, sulfinobenzol	-
	Benzolsulfen kislota, sulfenobenzol	-
	4-metilbenzol-1-sulfoxlorid	p-toluolsulfokislota xlorangidridi, p-toluolsulfoxlorid
	Benzolsulfonamid, benzolsulfamid	Sulfamoilbenzol
	Fenil-p-toluolsulfonat	p-toluolsulfokislota fenil efiri, feniltozilat, fenil-p-toluolsulfonat
	Fenilsulfonilbenzol	Difenilsulfon
	Fenilsulfmilbenzol	Difenilsulfoksid, sulfinildibenzol
	Metiltiobenzol	Metilfenilsulfid

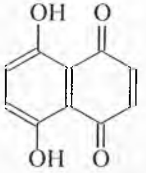
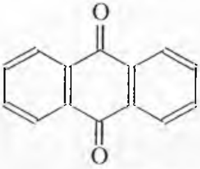
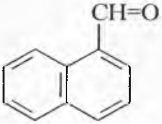
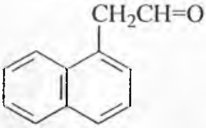
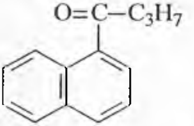
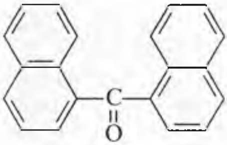
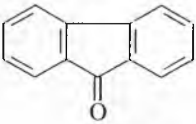
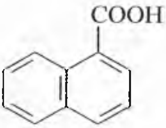
Naftalin va ba'zi kondensirlangan uglevodorodlar xosilalarining nomlanishi

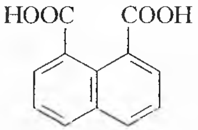
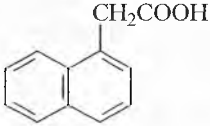
Birikmaning tuzilish formulasi	Nomlanishi		
	Sistematik	alternativ	Trivial
	1-metilnaftalin	α-metilnaftalin	-
	2-etilnaftalin	β-etilnaftalin	-

	1-benzilnaftalin	α-benzilnaftalin	-
	Naftalin-1-sulfon kislota	α-naftalinsulfo kislota	-
	2-gidroksi-naftalin-3,6-disulfon kislota	2-gidroksi-naftalin-3,6-disulfokislota	R-kislota
	1-gidroksi-8-aminonaftalin-3,6-disulfon kislota	1-gidroksi-8-aminonaftalin-3,6-disulfokislota	N-kislota
	2-gidroksi-naftalin-6,8-disulfon kislota	2-oksinaftalin-6,8-disulfokislota	G-kislota
	4-aminonaftalin-1-sulfo kislota	4-aminonaftalin-sulfokislota	Naftion kislota
	4,6-disulfo-1-naftoy kislota	-	-
	1-nitronaftalin	α-nitronaftalin	-

	10-nitrofenantren	-	-
	2-naftilamin, naftalin-2-amin	β-naftilamin, 2-aminonaftalin	-
	Naftalin-1,4-diamin	1,4-diamino-naftalin	-
	N-fenilnaftil-2-amin	(fenil)(2-naftil) amin	-
	1,2'-azonaftalin	α,β-azonaftalin	-
	Naftalin-2-azobenzol	α-naftilazobenzol	-
	1-karboksi-naftalin-2-azobenzol	-	-
	4-(2-gidroksi-1-naftilazo)benzol sulfon kislota	p-(2-oksi-1-naftalin-azo)benzolsul-fokislota	-

	2-(2-naftil) etanol	Naftalin-2-etanol	β-(β-naftil) etanol
	1-gidroksinaftalin	α-oksinaftalin	α-naftol
	1-gidroksixrizen	1-oksixrizen	-
	9-antrol, 9-gidroksi-antrasen	9-oksiantrasen	-
	1,4-digidroksi-naftalin	1,4-dioksi-naftalin, naftalin-1,4-diol	α-nafto-gidroxinon
	2-metoksinaftalin	-	Nerolin
	2,6-naftoxinon	-	Amfinafto-xinon
	1,4-naftoxinon	-	Naftoxinon

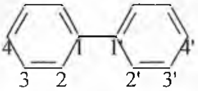
	5,8-digidroksi-1,4-naftoxinon	5,8-dioksi-1,4-naftoxinon	Naftazarin
	9,10-antraxinon	-	Antraxinon
	Naftalin-1-karbaldegid	1-formilnaftalin	-
	(1-naftil)asetal-aldegid, 1-naftalinatset-aldegid	α-naftiletanal	α-naftilatset-aldegid
	1-butironafton, 1-(1-naftil)butan-1-on	1-butiroilnafton	α-naftil-propilketon
	1,1-dinaftilketon	-	-
	9-fluorenon	9-oksofluoren	Difenilen-keton
	Naftalin-1-karbon kislota	-	α-naftoy kislota

	Naftalin-1,8-di-karbon kislota	-	Naftal kislota
	1-naftilsirka kislota, naftalin-1-sirka kislota	1-naftalinsirka kislota, naftalin-1-sirka kislota	α-Naftil-sirka kislota

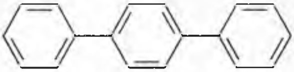
Ko'p yadroli aromatik birikmalar.
Ajratilgan benzol yadroli birikmalar

Ikki va undan ortiq benzol yadrolari bir-biri bilan oddiy bog'lar bilan bog'langan bo'lsa xalqalar soniga mos ravishda **bi-, ter-, kvater-** kabi old qo'shimchalar ishlatiladi.

Masalan:



bifenil



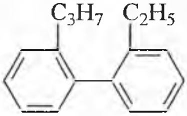
p-terfenil

Alifatik zanjir tutuvchi ko'p yadroli birikmalarni nomlashda quyidagi usullardan biri qo'llaniladi:

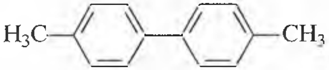
1) Alifatik yon zanjir aromatik uglevodorod nomidan oldin aytiladi;

2) Arimatik uglevodorod nomi alifatik qoldiq nomidan oldin aytiladi.

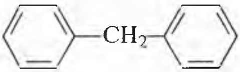
Masalan:



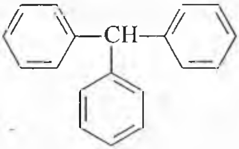
2-etil-2'-propilbifenil



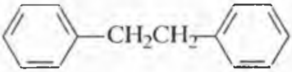
4,4'-dimetilbifenil



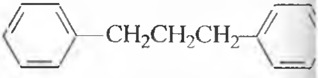
difenilmetan



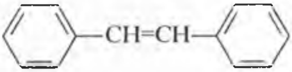
trifenilmetan



1,2-difenietan,



1,3-difenilpropan
dibenzil

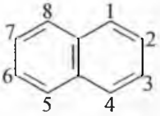


1,2-difenileten,
Stilben

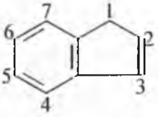
Kondensirlangan aromatik birikmalar

Kondersirlangan aromatik uglevodorodlar trivial (tarixiy) nomlar bilan nomlanadi va **-en** qo'shimchasi bilan tugaydi. Naftalin uchun qo'shimcha –**in**.

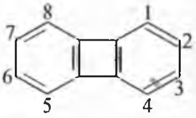
Masalan:



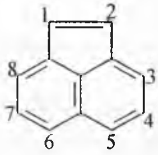
naftalin



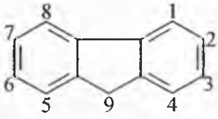
inden



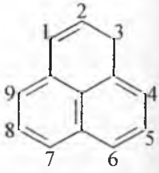
bifenilen



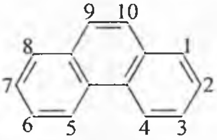
asenaftalin



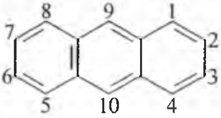
fluoren



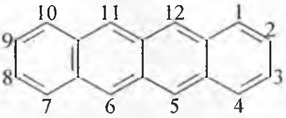
fenalen



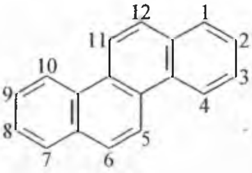
fenantren



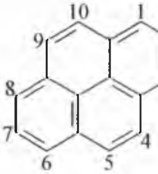
antratsen



naftatsen (tetratsen)



xrizen

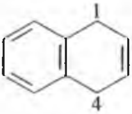


piran

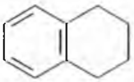
koren

Polisiklik uglevodorodlarni nomlashda eng ko‘p xalqani gorizantal xolda, qolganlarini esa gorizantal qatorning yuqorisiga yoki o‘ng tomoniga joylashtiriladi va soat strelkasi bo‘yicha eng yuqoridagi uglerod atomidan boshlab raqamlanadi. Ikki va undan ortiq xalqa uchun umumiy bo‘lgan uglerod atomlari raqamlanmaydi. Antrasen va fenantren uchun raqamlash bu qoidadan boshqacharoq bo‘lib o‘ziga xos raqamlanadi. Konyugirlangan qo‘sh bog‘lar soni uchtadan kam bo‘lgan xalqali polisiklik uglevodorodlarni nomlashda **digidro-, tetragidro-** old qo‘shimchalaridan so‘ng qaytarilmagan uglevodorod nomi keltiriladi.

Masalan:

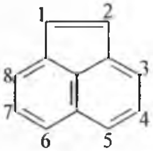


1,4-digidronaftalin

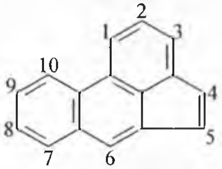


1,2,3,4-tetragidronaftalin

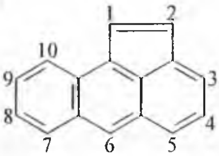
Pergidro- old qo‘shimchasi to‘liq gidratlanganlikni bildiradi. Quyidagi birikmalar uchun istisno sifatida ba’zi nomlar saqlanadi.



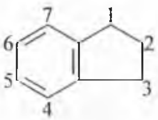
asenaften (asenaftilen)



asefenantren (asefenantrilen)



aseantren (aseantrilen)

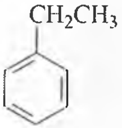


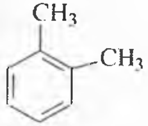
indan

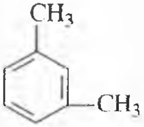
Misollar.

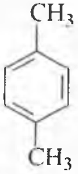
1. Etil benzolning barcha izomerlarini yozing va turli nomenklaturada nomlang.

Yechish:





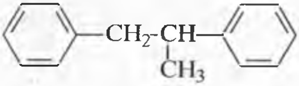




etilbenzol	o-ksilol,	m-ksilol,	p-ksilol
	o-dimetilbenzol,	m-dimetil benzol	p-dimetil benzol
	2-metiltoluol	3-metiltoluol	4-metiltoluol

2. 1,2-difenilpropaning tuzilish formulasini yozing.

Yechish:



Topshiriqlar.

1. Birlamchibutilbenzolning barcha izomerlari formulalarini yozing va nomlang.
2. Ajratilgan benzol yadroli birikma nima? Misol keltiring va nomlang.
3. Kondensirlangan aromatik birikma nima? Misol keltiring va nomlang.

VI. Geteroxalqali birikmalar

Geteroxalqali birikmalarni nomlashda quyidagi tartibga amal qilinadi.

1. Geteroxalqa birikmalar tarkibidagi geteroatomlarnomi O-**oksa**, S-**tia**, N-**aza**qo‘shimchalari yordamida ifodalanadi. Geteroxalqa tarkibida bir nechta geteroatom kelsa ularning kattaligi O->S->N->, azotli birikmalarda esa =NH>-N= tartibda bo‘ladi. Agar bir xildagi geteroatom kelsa di-, tri- va x.k. old qo‘shimchalar ishlatiladi.

2. Xalqadagi atomlar soniga qarab:

- uch a’zoli xalqalar uchun – **ir**- qo‘shimchasi;
- to‘rt a’zoli xalqalar uchun – **et**- qo‘shimchasi;
- besh a’zoli xalqala ruchun – **ol**- qo‘shimchasi;
- olti a’zoli xalqalar uchun – **in**- qo‘shimchasi;
- etti a’zoli xalqalar uchun – **ep**- qo‘shimchasi ishlatiladi.

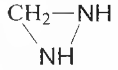
3. Xalqani to‘yinganligi:

- – **idin**- qo‘shimchasi azot atomi saqlagan to‘yingan xalqa;
- – **an**- qo‘shimchasi azot atomi bo‘lmagan to‘yingan xalqa;
- – **in**- qo‘shimchasi to‘yinmagan xalqa. Agar xalqa aromatik xususiyatga ega bo‘lsa in qo‘shimchasi qo‘shilmaydi.

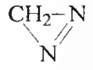
oksiran
etilenoksid

tiiran
etilensulfid

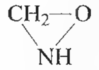
aziridin
etilenimin



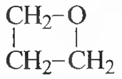
diazirid



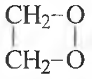
diazirin



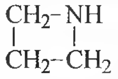
oksaziran



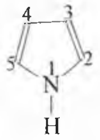
oksetan



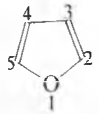
dioksetan-1,2



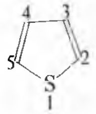
azetidin



pirrol
1-H-azol

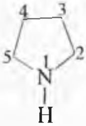


furan

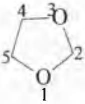


tiofen

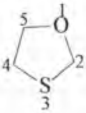
oksolan
tetragidrofuran



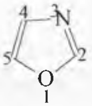
pirrolidin



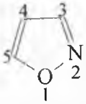
dioksolan-1,3



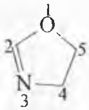
tiooksolan
3-tiatetragidrofuran



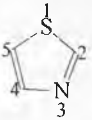
oksazol
1,3-oksazol



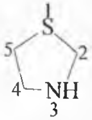
izoksazol
1,2-oksazol



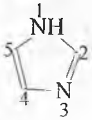
4,5-digidrooksazol
2-oksazolin



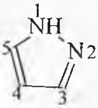
tiazol



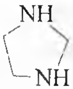
tiazolidin



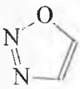
1,3-diazol,
imidazol



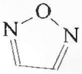
1,2-diazol,
pirazol



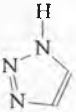
imidazolin



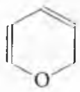
1,2,3-oksadiazol



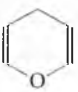
1,2,5-oksadiazol



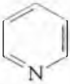
1,2,3-triazol



1,2-oksin,
2H-piran,
α-piran

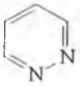


1,4-oksin,
4H-piran,
γ-piran

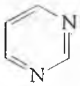


azin

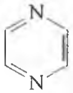
piperidin



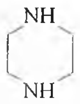
piridazin,
1,2-diazin



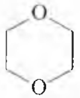
pirimidin,
1,3-diazin



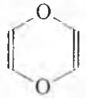
pirazin,
1,4-diazin



piperazin
pergidro-1,4-diazin



1,4-dioksan

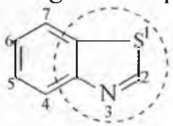


1,4-dioksin

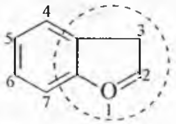
Politsiklik birikmalar

Polisiklik birikmalar quyidagi qoidalarga muvofiq nomlanadi.

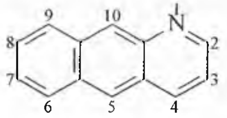
1. Nomlashning asosi geteroatom tutgan sikl bo'lib, u bilan kondensirlangan xalqa old qo'shimcha sifatida ishlatiladi. Oddiy nomga ega bo'lgan katta geteroxalqa nomlashning asosi bo'ladi.



benzotiazol



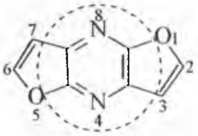
benzofuran



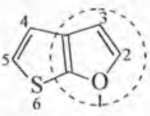
benzoxinolin

2. Birikmada 2 ta geteroatom tutgan xalqa mavjud bo'lsa nomlashning asosi azot tutgan, keyin kislorod tutgan, keyin esa oltingugurt tutgan xalqa bo'ladi. Raqamlashda kislorod geteroatomiga eng kichik raqam qo'yiladi.

Masalan:



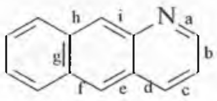
difuropirazin



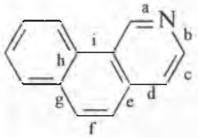
tienofuran

3. Xalqalar qaysi tomonlari (qirralari) bilan birikkanini ifodalash uchun 1,2-bog'laridan boshlab kursiv lotin xarflari (a,b,c,d,e,f...) qo'llaniladi, old qo'shimchada keladigan xalqa shunday qaramlanadiki, tutashishda ishtirok etadigan bog' va xarf eng kichik va dastlabki xarflar bo'lsin.

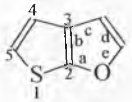
Masalan:



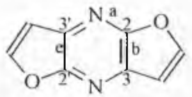
benzo[**g**] xinolin
(g-atomi bilan tutashgan)



benzo[**h**]izoxinolin



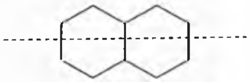
tieno[2,3-**b**]furan



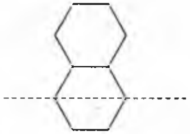
difuro[2,3-**b**;2'3'-**e**]pirazin

4. Polisiklik birikmalar xalqasi chetidagi atomlarni raqamlash uchun quyidagi qoidalarga rioya qilish kerak.

a) eng ko‘p xalqalar gorizontal o‘q bo‘yicha joylashishi kerak:

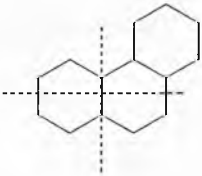


to‘g‘ri joylashish

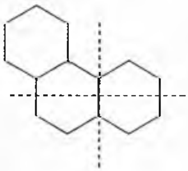


noto‘g‘ri joylashish

b) ko‘p xalqalar mavjud bo‘lganda ularning eng ko‘pi gorizantal o‘qning o‘ng yuqorisida bo‘lishi kerak:

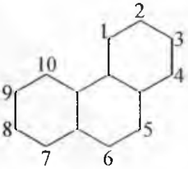


to‘g‘ri joylashish



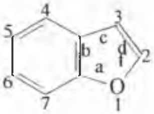
noto‘g‘ri joylashish

c) raqamlash o‘ng yuqoridagi xalqaning eng uzoq atomidan boshlanib soat streklasi bo‘yicha amalga oshiriladi. Xalqalar birlashgan joydagi atomlardan o‘tib raqamlash davom ettiriladi.

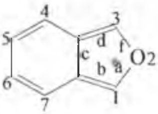


Geteroatom eng kichik raqam bilan raqamlanadi.

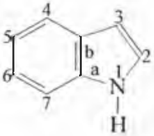
Quyida ba'zi politsiklik birikmalarga misollar keldirilgan.



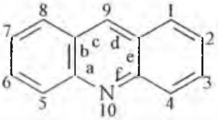
benz[b]furan,
kumaron



benz[c]furan,
izobenzfuran

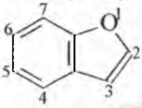
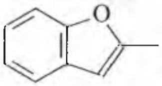
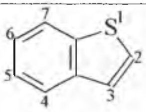
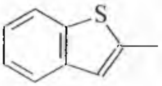
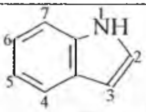
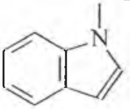
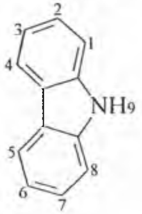
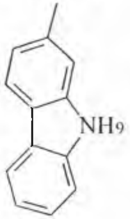


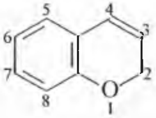
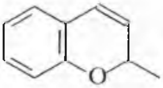
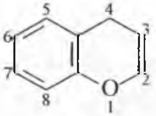
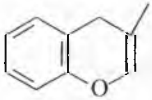
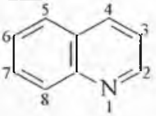
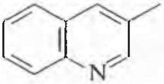
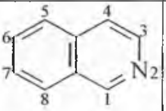
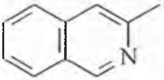
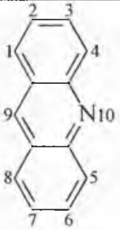
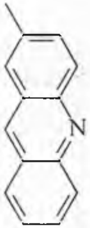
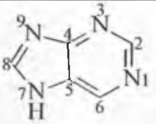
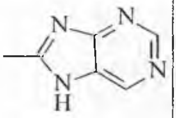
benz[b]pirrol,
indol



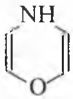
dibenzo[b,e]piridin,
akridin

Ba'zi muxim poligeterotsiklik birikmalar va ularning bir valentli radikali

Birikmaning tuzilish formulasi	Birikmani nomlash		Radikalning tuzilish formulasi	Radikalning nomlanishi
	Sistematik nomlash	Trivial		
	Benzo[*b*]furan	Benzofuran		2-benzofuril
	Benzo[*b*]tiofen	Tionaften		1-benzotiofen-2-il
	Benzo[*b*]pirrol	Indol		1-indol-1-il
	Benzo[*b*]indol	Karbazol		Karbazol-2-il

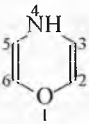
	2H-Xromen	α-Xromen		2H-Xromen-2-il
	4H-Xromen	γ-Xromen		4H-Xromen-3-il
	Benzo[*b*]piri-din	Xinolin		Xinolin-3-il
	Benzo[*c*]piri-din	Izoxinolin		3-izoxinolil
	Dibenzo[*b,e*]pi-ridin	Akridin		Akridin-2-il
	Imidazo-[4,5-*d*] pirimidin	Purin		Purin-8-il

Misollar.



1. Berilgan moddani nomlang.

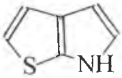
Yechish:



4-H-1,4-oksazin

2. Tieno[2.3-**b**]pirolning tuzilish formulasini yozing.

Yechish:

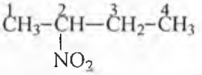


Topshiriqlar.

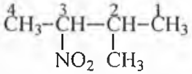
1. Geteroxalqali birikma nima va ularni nomlash qoidasi qanday? Misol keltiring.
2. Politsiklik birikma nima va ularni nomlash qoidasi qanday? Misol keltiring.
3. Politsiklik birikmalar xalqasi chetidagi atomlarni raqamlashda qanday qoidalarga amal qilish zarur?

VII. Azotli organik birikmalar

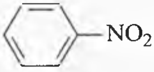
Nitro guruh ($-NO_2$) galogenlarga o‘xshab funksional gurux hisoblanmaydi.



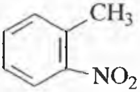
2-nitrobutan



2-metil-3-nitrobutan

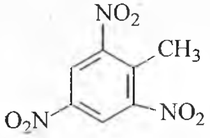


nitrobenzol



1-metil-2-nitrobenzol,
2-nitrotoluol

1,3-dinitrobenzol

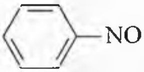


1-metil-2,4,6-trinitrobenzol,
2,4,6-trinitrotoluol

Nitro birikmalarning izomeri xisoblangan nitritlarning tarkibida $-O-N=O$ funksional guruh tutgan bo‘ladi.

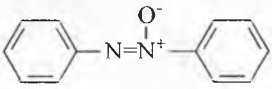
$$CH_3-CH_2-O-N=O$$

etilnitrit

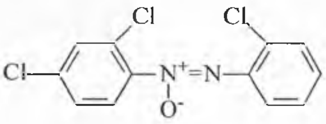


nitrozobenzol

1-metil-4-nitrozobenzol,
4-nitrozotoluol

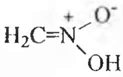


azoksibenzol

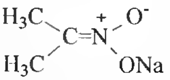


2,2',4'-trixlorazoksibenzol

Tarkibida $=N^+(-O^-)OH$ guruh saqlagan birikmalarni nomlashda atsinitro- old qo‘shimchasini tegishli uglevodorod nomida keltiriladi.



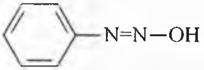
atsinitrometan



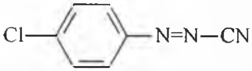
2-atsinitropropan natriyli tuzi

$CH_2=N^+=N^-$

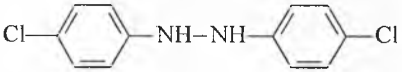
diazometan



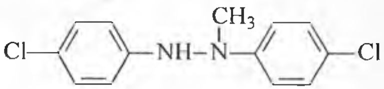
benzoldiazogidroksid,
diazogidrat



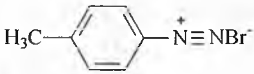
4-xlorbenzoldiazotsianid



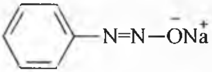
4,4'-dixlorgidrazobenzol



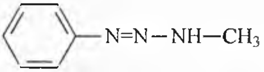
4,4'-dixlor-N-metilgidrazobenzol



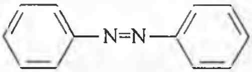
4-metilbenzoldiazoniy bromid



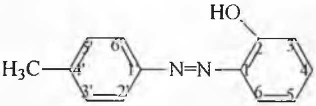
natriy benzoldiazotat,
natriy fenildiazotat



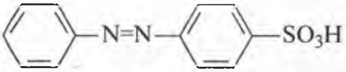
3-metil-1-feniltriazen



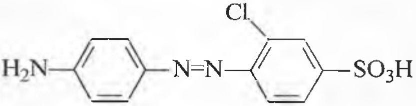
azobenzol



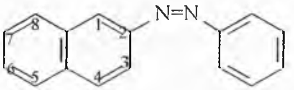
2-gidroksi-4'-metilazobenzol



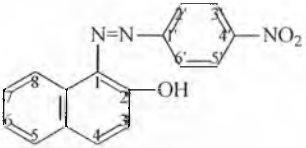
-4-sulfon kislota,
4-fenilazobenzol sulfokislota



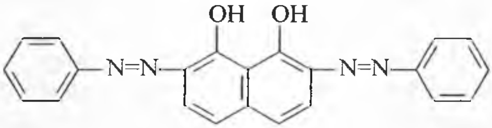
4'-amino-2-xlorazobenzol-4-sulfon kislota,
4-aminofenilazo-3-xlorbenzol sulfokislota



2-benzolazonaftalin



1-(4'-nitrobenzolazo)-2-naftol



2,7-bis(benzolazo)-(naftalin-1,8-diol),
2,7-bis(fenildiazenil)-(naftalin-1,8-diol)

AMINLAR

Birlamchi aminlar.

Ratsional nomenklatura asosida nomlanganda **–amin** suffiksini uglevodorod radikalidan keyin qo'shib nomlanadi.

CH_3NH_2	$CH_3CH_2CH(NH_2)CH_2CH_2CH_3$	$CH_3CH_2CH(NH_2)CH_3$
metilamin	1-etilbutilamin	ikkilamchi butil amin

O'rinbosarli nomenklatura asosida nomlaganda **amino-** perefiksi ishlatiladi.

CH_3NH_2	$CH_3CH_2CH(NH_2)CH_2CH_2CH_3$	$CH_3CH_2CH(NH_2)CH_3$
aminometan	3-aminogeksan	2-aminobutan

$NH_2(CH_2)_4NH_2$	$NH_2(CH_2)_5NH_2$	$CH_3(NH_2)CH(CH_2)_3NH_2$
1,4-butandiamin	1,5-pentandiamin	1,4-pentandiamin
tetrametilendiamin	pentametilendiamin	1-metiltetrametilendiamin

Ikkilamchi va uchlamchi aminlar

$$CH_3CH_2CH_2CH_2CH_2{-}N(CH_3)_2$$

N,N-dimetilpentilamin
1-dimetilaminopentan

$$CH_3CH_2CH_2CH_2-N{<}^{CH_3}_{CH_2CH_3}$$

N-metil-N-etilbutilamin
1-metiletilaminobutan

$$CH_3CH_2\overset{NHCH_3}{\overset{|}{C}}HCH_3 \qquad CH_3CH_2\overset{N(CH_3)_2}{\overset{|}{C}}HCH_3$$

N-metil ikkilamchi butil amin — N,N-dimetil ikkilamchi butil amin
2-metilamino butan — 2-dimetilaminobutan

Ammoniyli tuzlar

$[N(CH_3)_4]^+I^-$ Tetrametilammoniy yodid

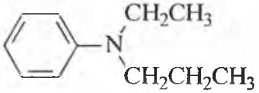
$$CH_3CH_2CH_2CH_2CH_2CH_2-\overset{CH_3}{\underset{CH_2CH_3}{N^{\pm}}}-CH_2CH_3\ Cl^-$$

Geksilmetildietiammoniy xlorid

Misollar.

N-propil-N-etilfenilaminning tuzilish formulasini yozing.

Yechish:

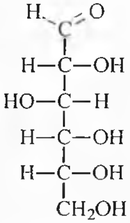


Topshiriqlar.

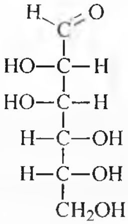
1. Azotli organik birikmalarning klassifikatsiyasiga misollar keltiring va nomlang.
2. Aminlarning klassifikatsiyasiga misollar keltiring va nomlang.
3. N,N-dimetilpentilaminning barcha izomerlarining formulalarini yozing va turli nomenklaturada nomlang.

VIII. Uglevodlar

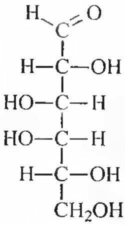
Aldopentozalarni sistematik nomenklatura bo'yicha 2,3,4,5-tetragidroksipentanal, aldogeksozani 2,3,4,5,6-pentagidroksigeksanal, ketopentozani1,3,4,5-tetragidroksipentanon-2, ketogeksoza (fruktoza)ni 1,3,4,5,6-pentagidroksigeksanon-2 deb nomlanadi. Uglevodlar asosan trivial nomenklaturada nomlanadi.



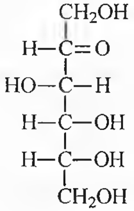
D-glyukoza



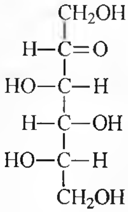
D-mannoza



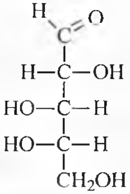
D-galaktoza



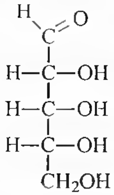
D-fruktoza



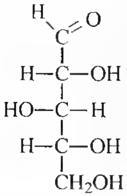
L-sorboza



L-arabinoza

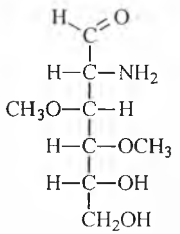


D-riboza

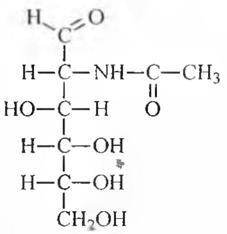


D-ksiloza

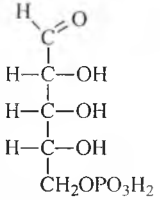
Uglevodlarning xosilalarini nomlashda trivial nomi asos qilib olinadi. Eng uzun zanjir raqamlab olinadi. Bunda karbonil gurux yaqin joydan raqamlash boshlanadi. O'rinbosarlarning joylari raqamlar bilan ko'rsatiladi. Agar o'rinbosarlar uglerod atomi bilan bog'lanmagan bo'lsa unda qaysi atom bilan bog'langani ko'rsatilib o'tiladi.



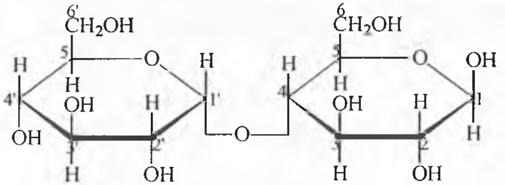
2-dezoksi-2-amino-
-3,4-di-O-metilglyukoza



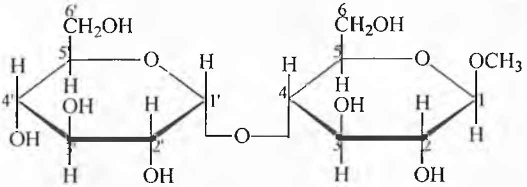
2-dezoksi-2-N-asetil-
aminoglyukoza



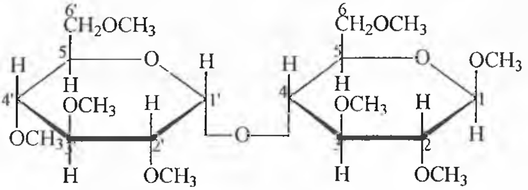
5-O-digidrofosfat-riboza



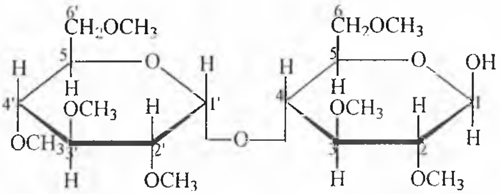
β-maltoza
4-O-(α-D-glyukopiranozil)-β-D-glyukopiranoza
O – α- D-glyukopiranozil-(1→4) -β - D-glyukopironoza



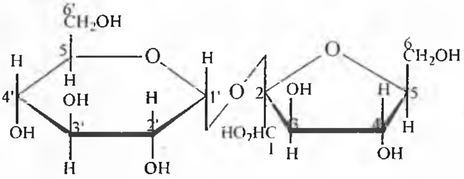
metil-β-D-maltozid



1,2,3,6,2`,3`,4`,6`-okta-O-metil-β-D-maltozid



1,2,3,6,2`,3`,4`,6`-okta-O-metil-β-D-maltoza

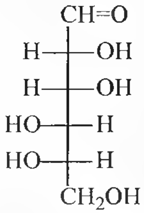


Saxaroza
2-O-(α-D-glyukopiranozil)-β-D-fruktofuranozid

Misollar.

L-mannozaning formulasini yozing.

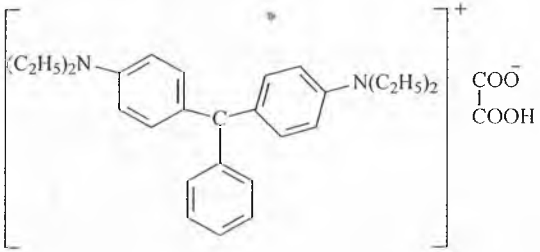
Yechish:



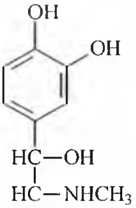
Topshiriqlar.

1. Fruktozani ochiq va yopiq formulasini yozing va nomlang.
2. 3-dezoksi-3-N-dimetilaminoglukozaning tuzilish formulasini yozing.

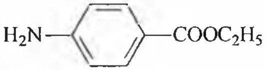
IX. Ba'zi tabiiy birikmalar, dorivor preparatlar, pestisidlarning tuzilishi va nomlari



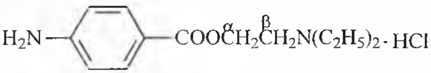
Briliant yashili - 4,4′-bis-(dietilamino)trifenilmetilgidrooksalat



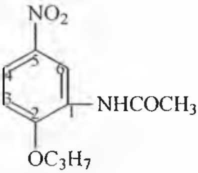
Adrenalin - α-3,4-digidroksifenil-β-metilaminoetanol



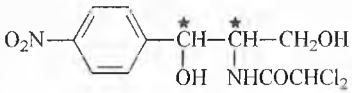
Anestezin - etil p-aminobenzoat



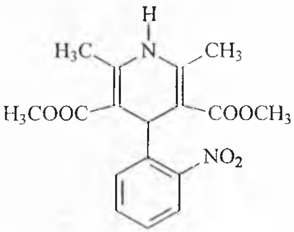
Novokain - β- dietildaminoetil p-aminobenzoat gidroxlorid



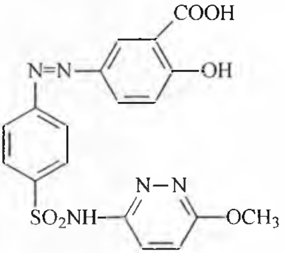
Falimint - 2-propoksi-5-nitroatsetanilid



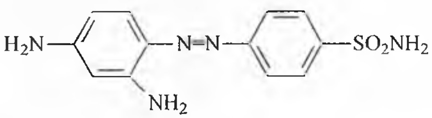
Levomitsetin - 1-(4-nitrofenil)-2-(dixlorasetilamino)-propandiol-1,3



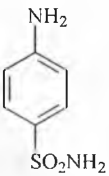
Nifedipin - 4-(2′-nitrofenil)-2,6-dimetil-3,5-dikarbmetoksi-1,4-digidropiridin



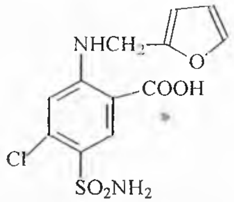
Salazopiridazin - 5-[4-(N-2,3-diaza-4-metoksipiridazil)sul`faminofenilazo] salitsil kislota



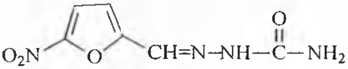
Prontozil- 4-(2,4-diaminofenilazo)benzolsul`famid



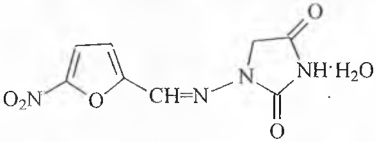
Streptosid - p-aminobenzolsulfamid



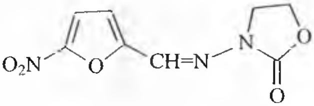
Furosemid – N-4-(aminosulfo-2-karboksi-5-xlorfenil)2-furfurilamin



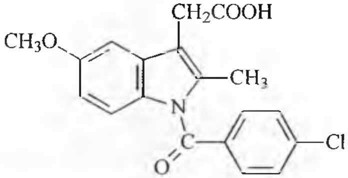
Furatsilin - 5-nitrofurfurol semikarbazoni



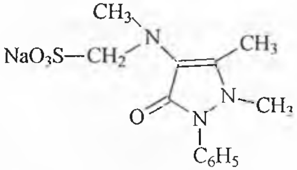
Furadonin- 1-(5-nitro-2-furfural-N-amino)imidazoldion-2,4 gidrati



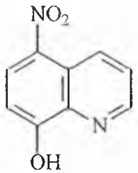
Furazolidon-(5-nitro-2-furfural-N-amino)oksazolidon-2



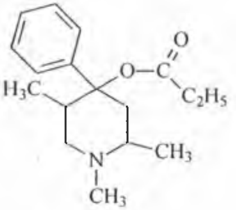
Indometasin - 2-metil-5-metoksi-1-(4-xlorbenzoil)-3-indolilsirka kislota



Analgin – natriy-1-fenil-2,3-dimetil-pirazolon-5-4-N-metil-4-N-metilenaminosulfonat



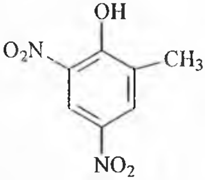
Nitroksolin- 8-gidroksi-5-nitroxinolin



Promedol- propan kislotasining 4-fenil-1,2,5-trimetil-4-piperidil efiri

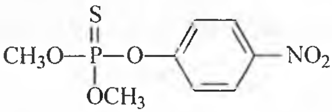
Insektisidlar - o'simliklar kasalliklari va zararkunandalariga qarshi qo'llaniladigan kimyoviy vositalar.

1. DNOK - dinitro-orto-krezol (texnik nomi)



2-metil-4,6-dinitrofenol (ilmiy nomi)

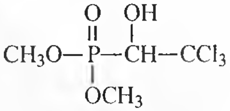
2. Metofos – (texnik nomi)



Tiofosfat kislotaning dimetil-p-nitrofenil efiri

O-,O-dimetil-O-(4-nitrofenil)-tiofosfat (ilmiy nomi)

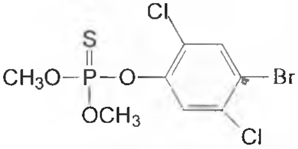
3. Xlorofos (texnik nomi)



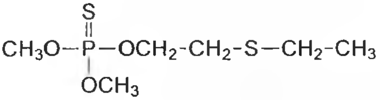
1-gidroksi-2,2,2-trixloretilfosfonat kislotaning dimetil efiri

O-,O-dimetil(1-gidroksi-2,2,2-trixloretil)fosfonat (ilmiy nomi)

4. Bromofos (texnik nomi)

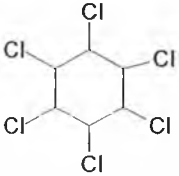


Tiofosfat kislotasining dimetil-4-brom-2,5-dixlorfenil efiri
O,O-dimetil-O-(4-brom-2,5-dixlorfenil)tiofosfat (ilmiy nomi)
5. Metilmerkaptofos (texnik nomi)



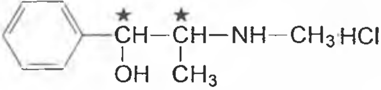
Tiofosfat kislotaning dimetil-2-etiltioetil efiri
O,O-dimetil-O-2-etiltioetiltiofosfat (ilmiy nomi)

6. Geksaxloran (texnik nomi)

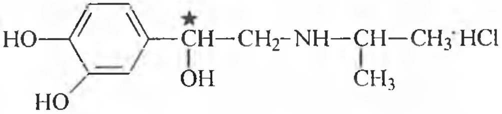


1,2,3,4,5,6-geksaxlorsiklogeksan (ilmiy nomi)

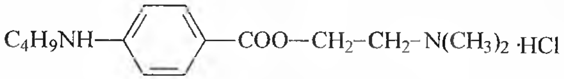
7. Efedrin gidroxloridi (texnik nomi)



L-(-)-eritro-2-metilamino-1-fenilpropanol-1 gidroxloridi (ilmiy nomi)
8. Izadrin (texnik nomi)



D,L-1-(3`4`-digidroksifenil)-2-izopropilaminoetanol-1 gidroxloridi (ilmiy nomi)
9. Dikain (texnik nomi)



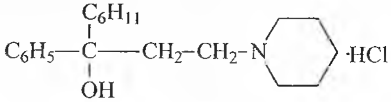
4-butilaminobenzoy kislotasining 2-dimetilaminoetil efirining gidroxloridi (ilmiy nomi)

10. Dimedrol (texnik nomi)

$$\underset{\displaystyle C_6H_5}{C_6H_5-\underset{|}{CH}}-O-CH_2-CH_2-N(CH_3)_2\cdot HCl$$

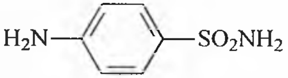
Benzgidrol 2-dimetilaminoetil efirining gidroxloridi (ilmiy nomi)

11. Tsiklodol (texnik nomi)



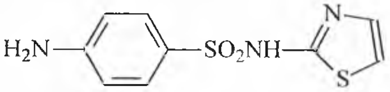
D,L-1-fenil-1-siklogeksil-3-(N-piperidil) propanol-1ning gidroxloridi (ilmiy nomi)

12. Oq spreptotsid (texnik nomi)



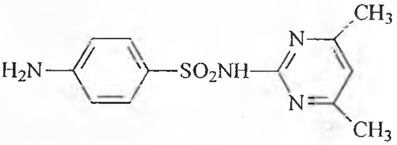
4-aminobenzolsul`fo kislotasining amidi (ilmiy nomi)

13. Norsul`fazol (texnik nomi)



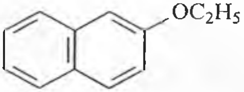
Sul`fanil kislotasining N-2-tiazolilamidi. (ilmiy nomi)

14. Sul`fadimezin (texnik nomi)



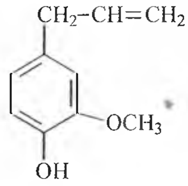
N-Sul`fanil-2-amino-4,6-dimetilpirimidin (ilmiy nomi)

15. Yangi nerolin (texnik nomi)



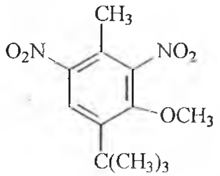
2-etoksinaftalin (ilmiy nomi)

16. Evgenol (texnik nomi)



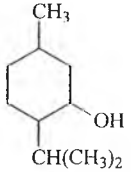
4-allil-2-metoksifenol (ilmiy nomi)

17. Muskus-ambret (texnik nomi)



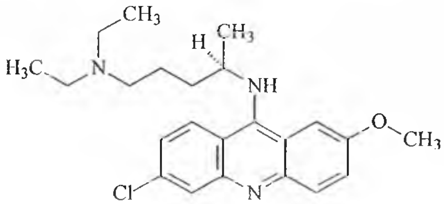
4-uchlamchibutil-3-metoksi-2,6-dinitrotoluol (ilmiy nomi)

18. Tabiiy mentol (texnik nomi)



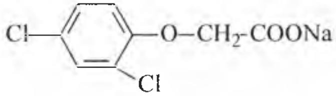
2-izopropil-5-metilsiklogeksanol (ilmiy nomi)

19. Mepakrin (akrixin)



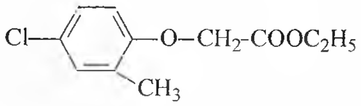
2-metoksi-6-xlor-9-(1-metil-4-dietilaminobutilamino)-akridin

20. 2,4-D



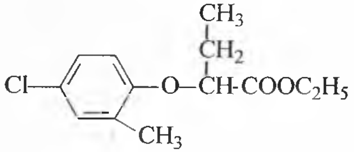
Natriy 2,4-dixlorfenoksiatsetat

21. 2M-4-X



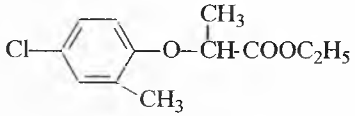
Etil 2-metil-4-xlorfenoksiatsetat

22. 2M-4XM



Etil-2-(2-metil-4-xlorfenoksi)-butirat

23. 2M-4XP

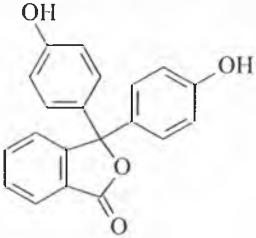


Etil-2-(2-metil-4-xlor-fenoksi)propionat

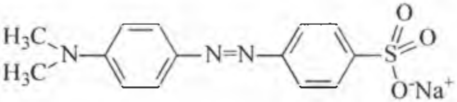
Moddalarning tuzilishini bilish uni xossasini bilishda muhim ahamiyatga ega. Shu munosabat bilan, yuqorida keltirilgan materiallar organik birikmalarning nomi asosida uning formulasini yozishga, formulasi asosida esa uni to‘g‘ri nomlashga o‘rgatadi.

X. Analitik kimyoda qo‘llaniladigan ba’zi organik birikmalar va ularning nomlanishi

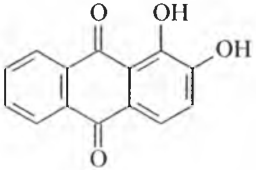
Fenolftalein- 4,4'-dioksiftalofenon; 3,3-bis-(4-gidroksifenil) ftalid)—trifenilmetan



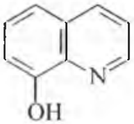
Metiloranj- Natriy 4-(4-dimetilaminofenilazo) benzolsulfonat



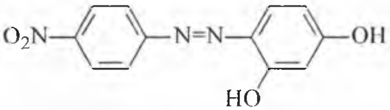
Alizarin – 1,2-digidroksiantraxinon



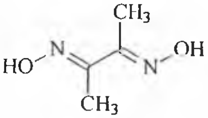
8-oksixinolin – ortooksixinolin



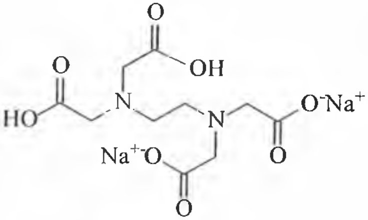
Magnezon I - 4-(p-nitrofenilazo)rezortsin



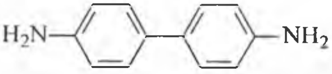
DMG (dimetilglioksim) - 2,3-butandiondioksim



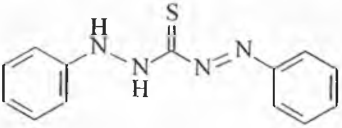
EDTA (ya'na boshqacha nom bilan yuritiladi: komplekson-III, trilon B, xelaton III) - etilendiamintetrasirka kislotaning dinatriyli tuzi



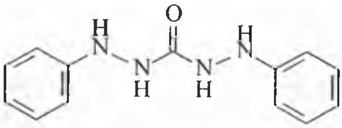
Benzidin- 4,4'-diaminodifenil



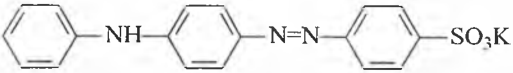
Ditizon – difeniltiokarbazon



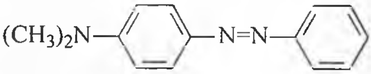
Difenilkarbazid - 1,5-difenilkarbogidrazid



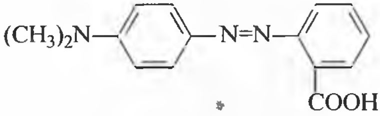
Tropeolin OO (difeniloranj) - Kaliy 4-(4-fenilaminofenilazo)benzolsulfonat



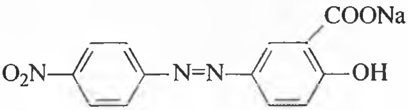
Metil sarig'i – 4-dimetilaminoazobenzol



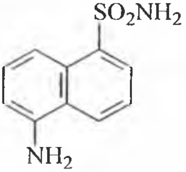
Metil qizili – 4-dimetilamino-2'-karboksiazobenzol



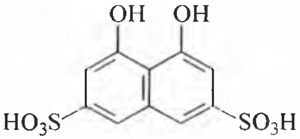
Alizarin sarig‘i R- Natriy 5-(4-nitrofenilazo-)-2-gidroksibenzoat



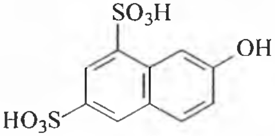
1,5-Naftilaminsulfamid – 5-amino-1-naftalin sulfokislotaning amidi



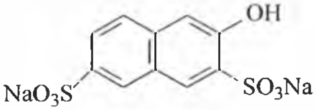
Xromotrop kislota- 2,8-digidroksi-3,6-naftalindisulfokislota



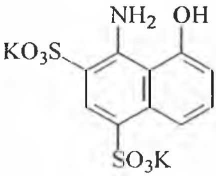
G-tuzi - 7-gidroksi-1,3-naftalindisulfokislotaning ikki kaliyli tuzi



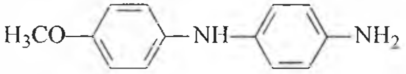
R-tuzi- 2-gidroksi-3,6-naftalindisulfokislotaning ikki natriyli tuzi



SS-kislotasi – 1-amino-8-gidroksi-2,4-naftalin disulfokislotaning ikki kaliyli tuzi

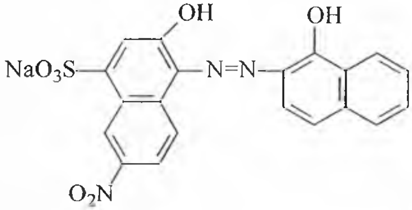


Variamin-V ko'ki – 4-(4-metoksifenilamino)anilin

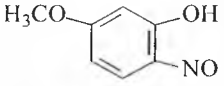


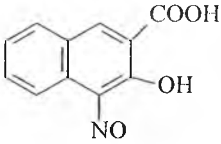
Dimetilnaftidin – 3,3'-dimetil-4,4'-diamino-1,1'-binaftil.

Erioxrom qorasi-T – 1'-(1-gidroksi-2-naftilazo)-2'-gidroksi-6'-nitro-4'-naftalin-sulfokislotaning natriyli tuzi



Tojimuxamedov H.S. reaktivlari.





2-nitrozo-5-metoksifenol 3-gidroksi-4-nitrozo-2-naftoy kislota

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