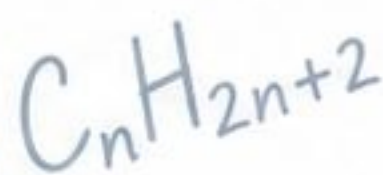


Organik
kimyo

Mavzu:

Organik birikmalarning sinflanishi



Kimyo fani o'qituvchisi:
Sodiqova Umidaxon Baxtiyarovna





Darsning maqsadlari

Kimyo
– hayotni
tushunish
kaliti!



Ta'limiy maqsad:

- ✓ Organik birikmalar haqida umumiy tushuncha berish.
- ✓ Organik birikmalarni turli belgilariga ko'ra sinflashni o'rgatish.
- ✓ Asosiy organik birikmalar sinflari (uglevodorodlar va ularning funksional hosilalari) misollar yordamida tanishtirish.



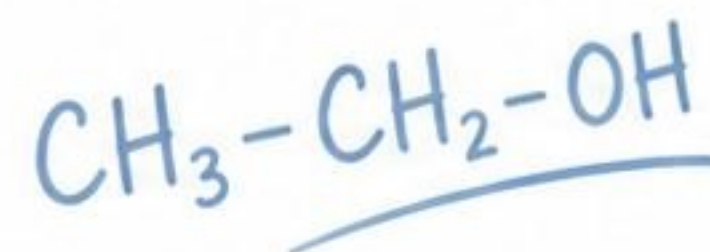
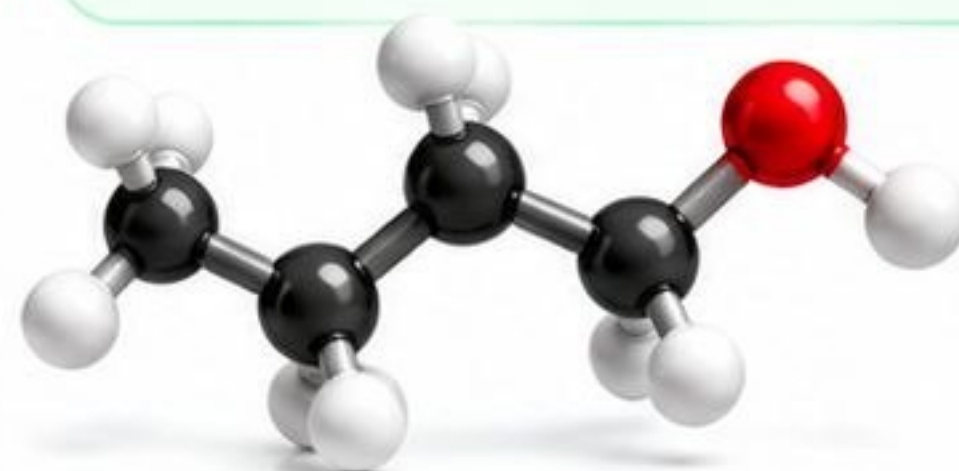
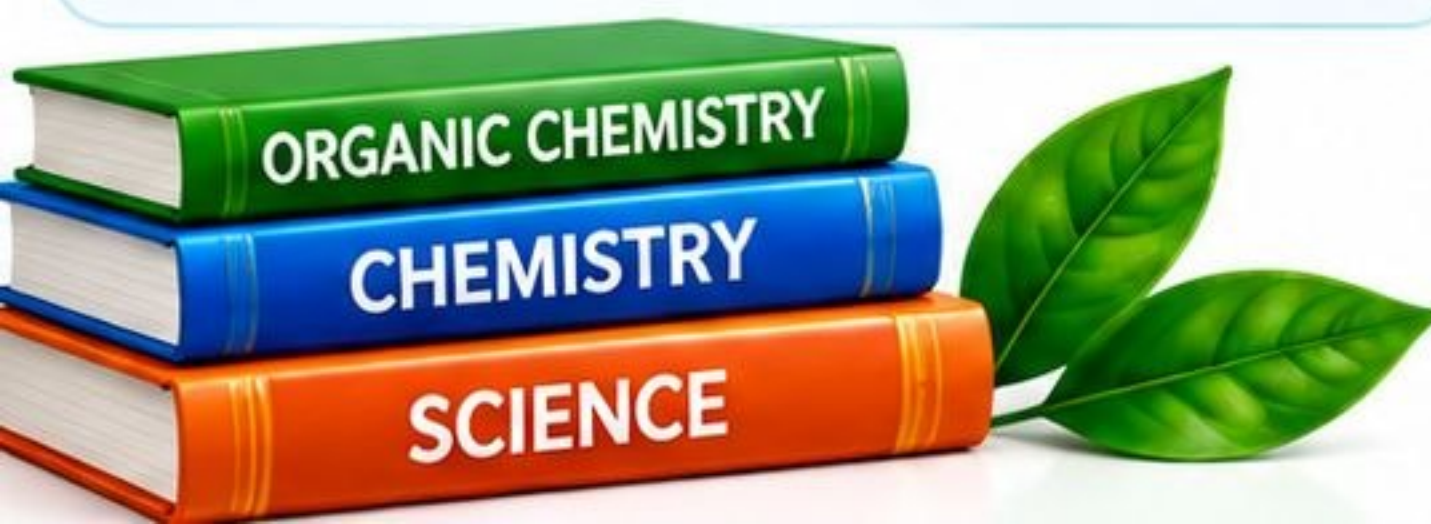
Tarbiyaviy maqsad:

- ✓ Tabiatdagi organik moddalar va ularning inson hayotidagi ahamiyatini tushuntirish.
- ✓ Atrof-muhitga mas'uliyatli munosabatda bo'lishga o'rgatish.
- ✓ Ilm-fanga qiziqish, estetik did va ekologik madaniyatni shakllantirish.



Rivojlantiruvchi maqsad:

- ✓ Tahlil qilish, taqqoslash va umumlashtirish ko'nikmalarini rivojlantirish.
- ✓ Mantiqiy fikrlash va kimyoviy tasniflash qobiliyatini shakllantirish.
- ✓ O'quvchilarda mustaqil ishlash, muammo yechish va amaliy hayot bilan bog'lash ko'nikmalarini o'stirish.



Kimyo
– hayotni
yaxshiroq
kaliti!

Darsning rejasi



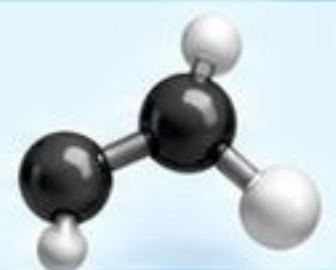
1

Organik birikmalar haqida umumiy tushuncha



2

Uglerod skeletiga ko'ra organik birikmalarning sinflanishi



3

Ochiq zanjirli organik birikmalar



4

Siklik organik birikmalar



5

Uglevodorodlarning sinflanishi



6

Funksional guruhiga ko'ra organik birikmalarning sinflanishi

-OH

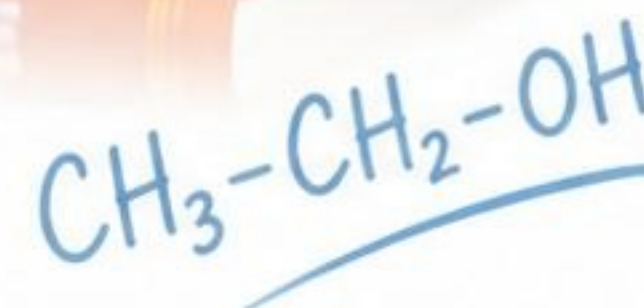
7

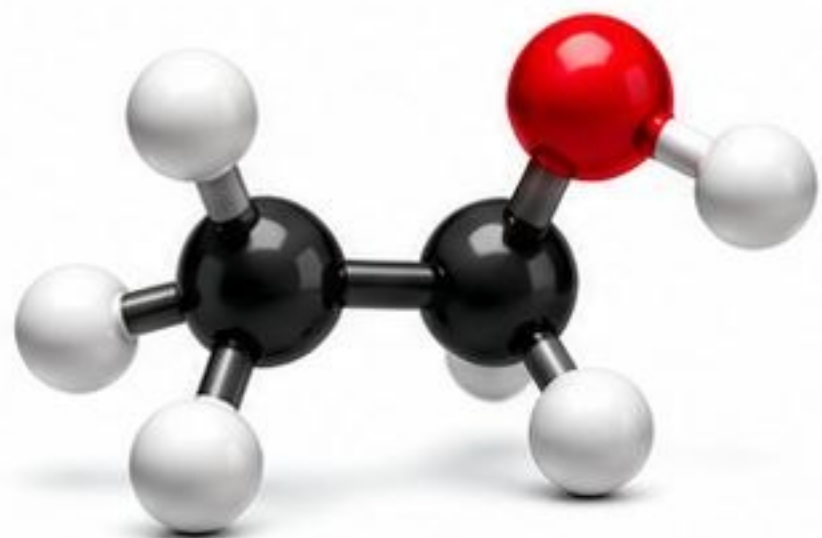
Organik birikmalar sinflarini umumlashtiruvchi sxema



8

Mustahkamlash va uyga vazifa





Organik birikmalar haqida umumiy tushuncha

Organik kimyo – hayot kimyosi!



Organik birikmalar – tarkibida asosan uglerod atomlari bo‘lgan, tabiatda keng tarqalgan va hayot jarayonlari bilan uzviy bog‘liq bo‘lgan birikmalardir.

Asosiy elementlar:



Uglerod



Vodorod



Kislorod



Azot



Oltingugurt



Fosfor

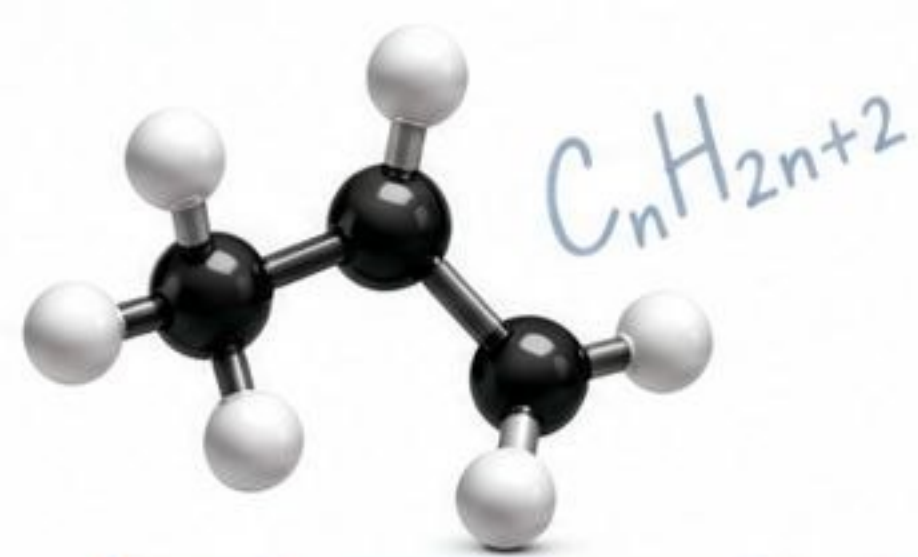
va boshqalar

Xususiyatlari:

- ✓ Uglerod atomlari o‘zaro mustahkam bog‘lanadi.
- ✓ Zanjirli va halqasimon tuzilmalarni hosil qiladi.
- ✓ Turli funksional guruhlariga ega bo‘ladi.
- ✓ Moddalarining soni juda ko‘p va xilma-xil.
- ✓ Tabiatda (neft, gaz, ko‘mir, tirik organizmlar) uchraydi.
- ✓ Sanoat, tibbiyot, qishloq xo‘jaligi va kundalik hayotda muhim ahamiyatga ega.

“Organik birikmalar – hayot asosidir!”





Uglerod skeletiga ko'ra organik birikmalarning sinflanishi

Organik
birikmalar –
uglerod imkoniyatlari
dunyosi!

Organik birikmalarni uglerod atomlarining o'zaro bog'lanish tartibi (skeleti) ga ko'ra **ikki katta guruhga ajratiladi**:

Ochiq zanjirli birikmalar

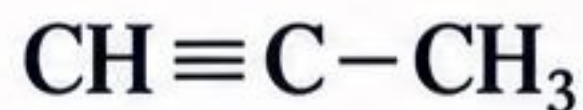
Uglerod atomlari ketma-ket ochiq zanjir hosil qiladi.



Propan



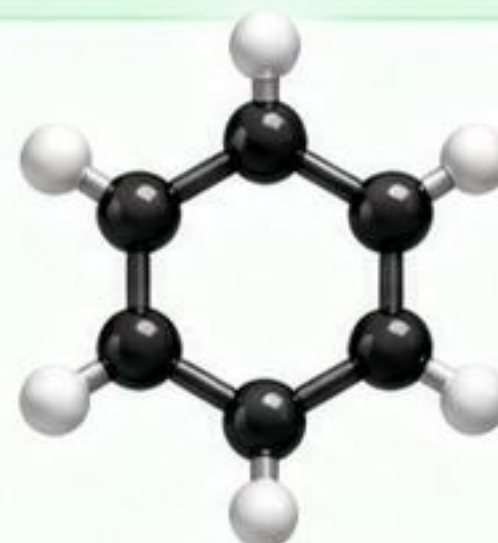
Propen



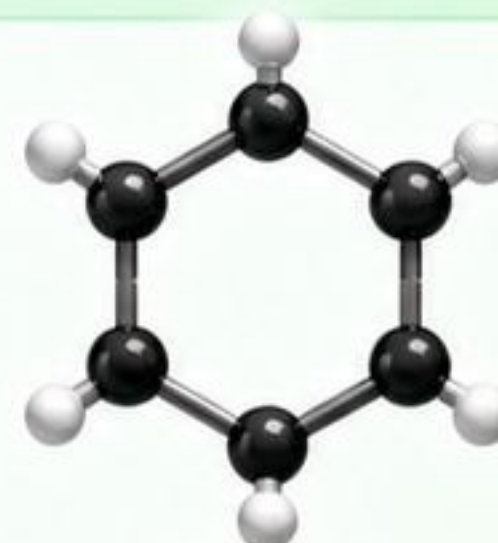
Propin

Siklik birikmalar

Uglerod atomlari halqa (siklik) tuzilma hosil qiladi.



Benzol

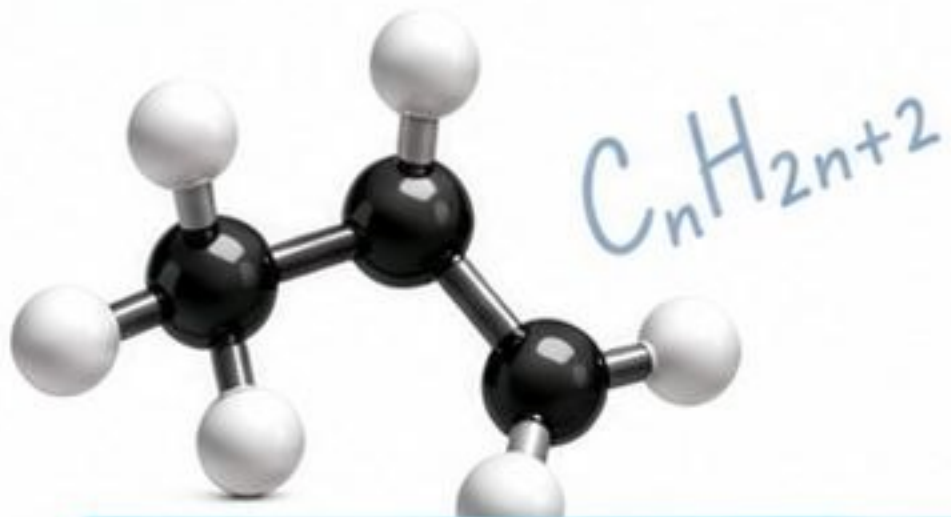


Siklogeksan

Xulosa:

Uglerod skeletining tuzilishiga ko'ra organik birikmalar **ochiq zanjirli** va **siklik** birikmalarga ajratiladi.





Ochiq zanjirli organik birikmalar



Ochiq zanjirli organik birikmalar – uglerod atomlari ochiq zanjir (tarmoqlanmagan yoki tarmoqlangan) ko‘rinishda birikkan birikmalardir.

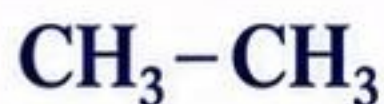
To‘yingan ochiq zanjirli birikmalar

Uglerod atomlari orasida faqat bitta (oddiy) bog‘ mavjud.

Umumiy formulasi:



Metan



Etan

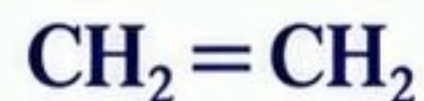
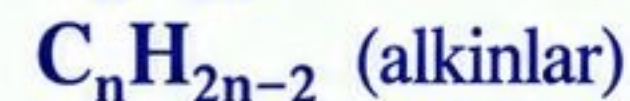
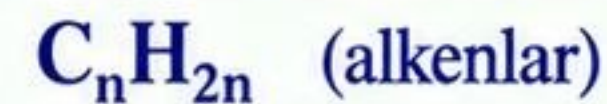


Propan

To‘yinmagan ochiq zanjirli birikmalar

Uglerod atomlari orasida qo‘sh (ikkilamchi) yoki uchlamchi bog‘ mavjud.

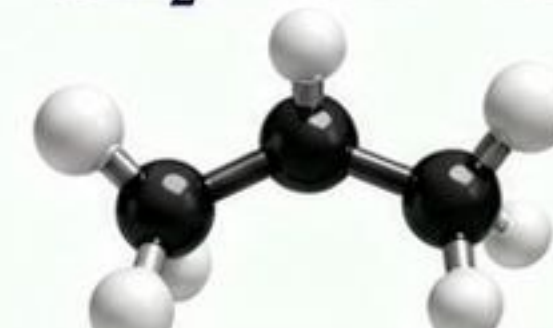
Umumiy formulalari:



Eten (etilen)



Etin (atsetilen)



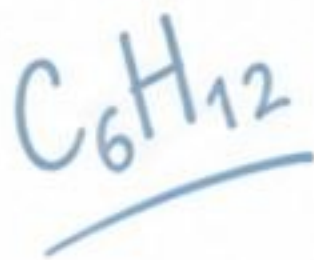
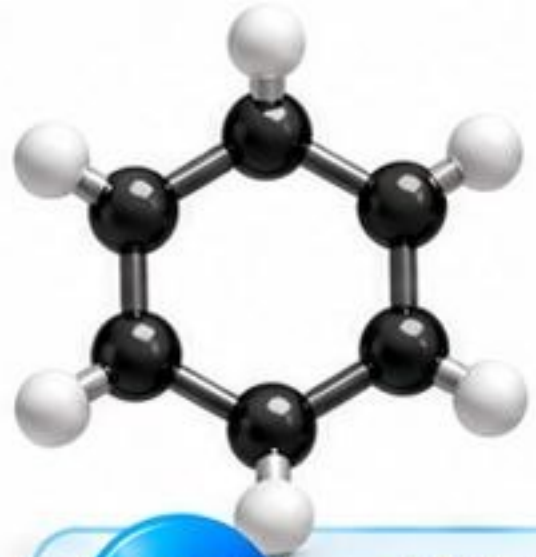
Propen



Xulosa:

Ochiq zanjirli organik birikmalar **to‘yingan (alkanlar)** va **to‘yinmagan (alkenlar, alkinlar)** birikmalarga bo‘linadi.





Siklik organik birikmalar



Siklik
tuzilma –
yangi
imkoniyatlar!



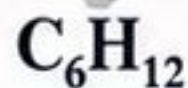
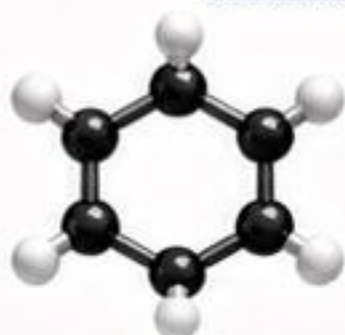
Siklik organik birikmalar – uglerod atomlari halqa (siklik) tuzilma hosil qilgan birikmalardir.

Karbosiklik birikmalar

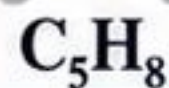
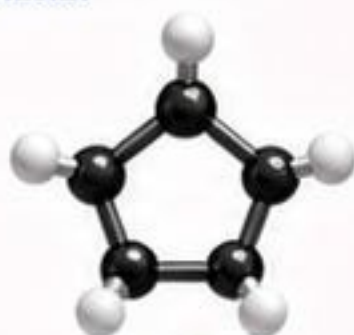
Halqada faqat uglerod atomlari bo'lgan birikmalar **karbosiklik birikmalar** deyiladi.

Alitsiklik birikmalar

To'yingan yoki to'yinmagan, lekin benzol halqasiga o'xshamagan siklik birikmalar.



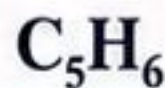
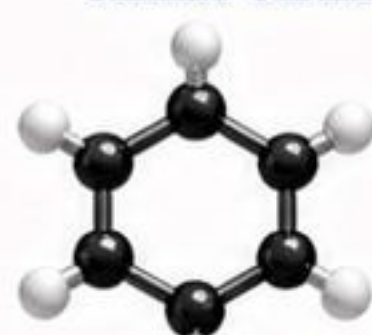
Siklogeksan



Siklopenten

Aromatik birikmalar

Benzol halqasiga o'xshash, qo'sh bog'lar almashinishiga ega siklik birikmalar.



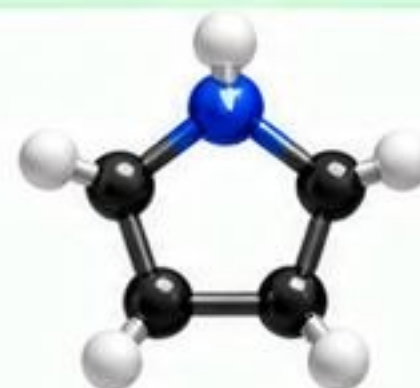
Benzol



Geterosiklik birikmalar

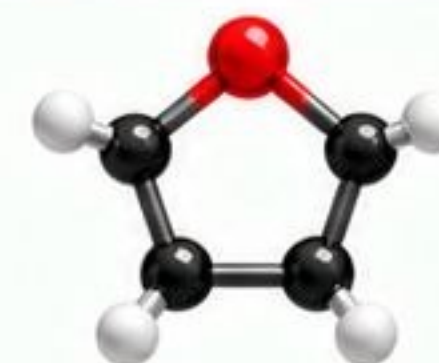
Halqa tarkibida uglerod atomlari bilan birga boshqa element atomlari (N, O, S va boshqalar) bo'lgan siklik birikmalar **geterosiklik birikmalar** deyiladi.

Azotli geterosiklik birikma



Pirrol

Kislorodli geterosiklik birikma



Furan

Oltinugurtli geterosiklik birikma



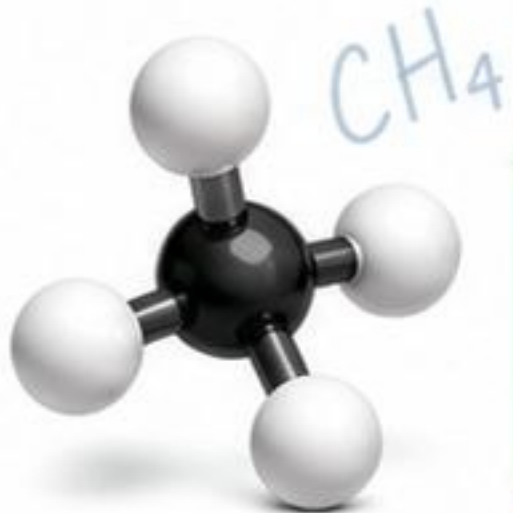
Tiofen



Xulosa:

Siklik organik birikmalar **karbosiklik** va **geterosiklik** birikmalarga ajratiladi. Karbosiklik birikmalar alitsiklik va aromatik birikmalarga bo'linadi.





Uglevodorodlar – faqat uglerod va vodorod atomlaridan tashkil topgan organik birikmalardir.

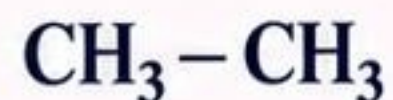
Ulevodorodlarning sinflanishi

Ulevodorodlar – organik kimyoning asosiy sinfi!

Alkanlar

To'yingan ulevodorodlar.
Molekulada faqat yakka bog'lar mavjud.

Umumiy formulasi:



Etan

Alkenlar

To'ymagan ulevodorodlar.
Molekulada bitta qo'sh bog' mavjud.

Umumiy formulasi:



Eten (etilen)

Alkinlar

To'ymagan ulevodorodlar.
Molekulada bitta uch bog' mavjud.

Umumiy formulasi:

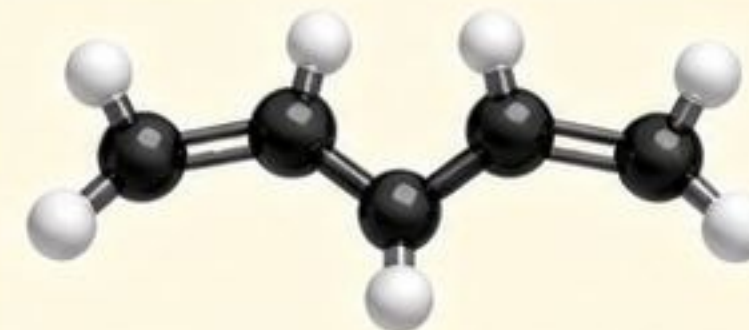
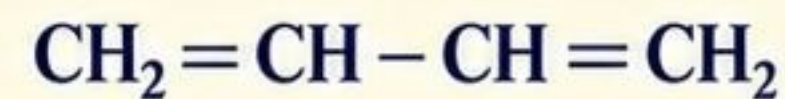


Etin (atsetilen)

Alkadiyenlar

To'ymagan ulevodorodlar.
Molekulada ikki qo'sh bog' mavjud.

Umumiy formulasi:

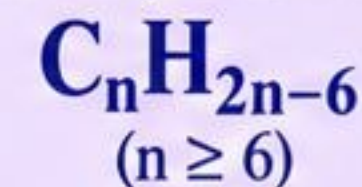


Buta-1,3-dien

Arenlar (aromatik)

Benzol halqasiga ega bo'lgan ulevodorodlar.

Umumiy formulasi:

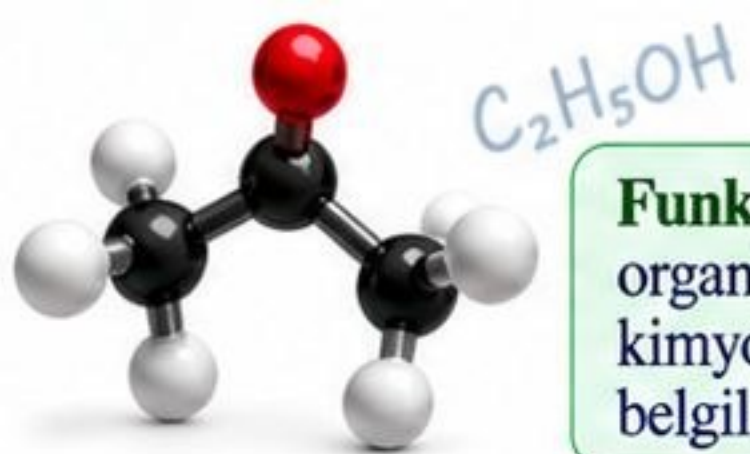


Benzol

Xulosa:

Ulevodorodlar tuzilishiga ko'ra alkanlar, alkenlar, alkinlar, alkadiyenlar va arenlarga bo'linadi.





Funksional guruh – organik birikmalarning kimyoviy xossalarini belgilovchi atomlar guruhi.

Funksional guruhiga ko'ra organik birikmalarning sinflanishi

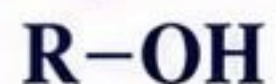
Har bir sinfn ing o'ziga xos funksional guruhi va xossalari mavjud!

Spirtlar

Funksional guruhi:



Umumiy formulasi:



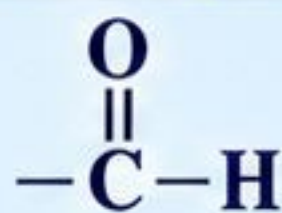
Misol:



Etanol

Aldegidlar

Funksional guruhi:



Umumiy formulasi:



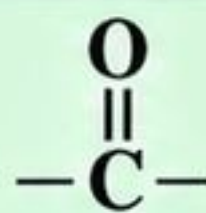
Misol:



Etanal

Ketonlar

Funksional guruhi:



Umumiy formulasi:



Misol:



Propanon (atseton)

Karbon kislotalar

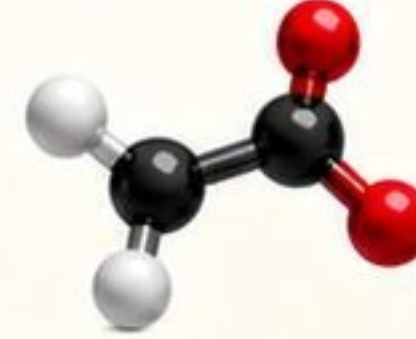
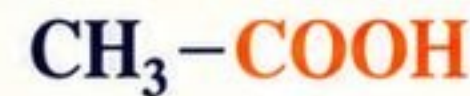
Funksional guruhi:



Umumiy formulasi:



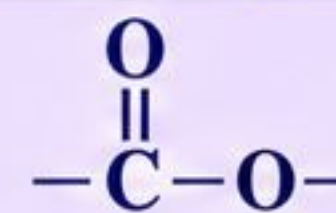
Misol:



Sirka kislota

Murakkab efirlar

Funksional guruhi:



Umumiy formulasi:



Misol:



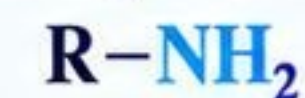
Metil asetat

Aminlar

Funksional guruhi:



Umumiy formulasi:



Misol:



Etilamin



Xulosa:

Organik birikmalar funksional guruhiga ko'ra spirtlar, aldegidlar, ketonlar, karbon kislotalar, murakkab efirlar va aminlarga ajratiladi.

Organik kimyo



✓ **Organik birikmalar** – tarkibida asosan uglerod atomlari bo'lgan va ko'pincha vodorod, kislorod, azot va boshqa elementlar ishtirok etadigan birikmalardir.

Organik birikmalar sinflari

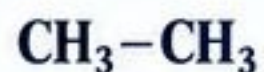
Asosiy xususiyatlari:

- ✓ Asosan kovalent bog'lanish.
- ✓ Izomeriyaga xos.
- ✓ Yonuvchan.
- ✓ Tabiatda keng tarqalgan va hayotimizda katta ahamiyatga ega.

Organik birikmalar

Uglevodorodlar (C, H)

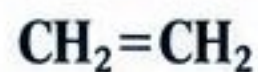
To'yingan (alkanlar)



- Faqat bitta bog'lar (σ).
- Nisbatan kam reaktiv.
- Misol: metan, etan.

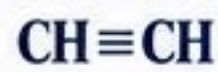
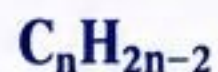
To'yingan

Alkenlar (C=C)



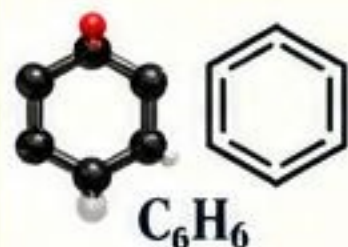
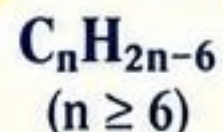
- Ikki qo'sh bog'.
- Reaktiv.
- Misol: eten, propen.

Alkinlar (C≡C)



- Uch bog'.
- Yuqori reaktiv.
- Misol: etin, propin.

Arenlar (aromatik)



- Benzol halqasi.
- Aromatik xossalar.
- Misol: benzol, toluol.

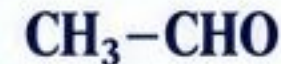
Kislorod tutuvchi birikmalar

Spirtlar (-OH)



- Hidroksil guruhi.
- Suvda yaxshi eriydi.
- Misol: etanol.

Aldegidlar (-CHO)



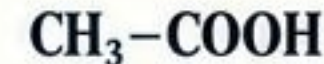
- Karbonil guruhi (zanjir oxirida).
- Oson oksidlanadi.
- Misol: etanal.

Ketonlar (>C=O)



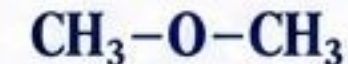
- Karbonil guruhi (zanjir ichida).
- Barqaror.
- Misol: propanon (aseton).

Karboksil kislotalar (-COOH)



- Karboksil guruhi.
- Kislotali xossalar.
- Misol: sirka kislota.

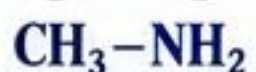
Efirler (-O-)



- Efir bog'i.
- Nisbatan kam reaktiv.
- Misol: dimetil efir.

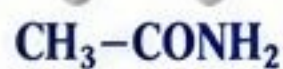
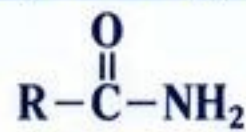
Azot tutuvchi birikmalar

Aminlar (-NH2)



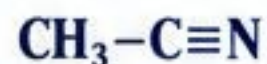
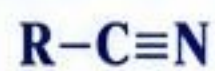
- Amino guruhi.
- Asosli xossalar.
- Misol: metilamin.

Amidlar (-CONH2)



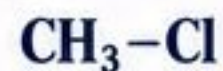
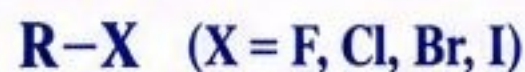
- Amid guruhi.
- Barqaror.
- Misol: atsetamid.

Nitrillar (-C≡N)



- Siyan guruhi.
- Yuqori reaktiv.
- Misol: atsetonitril.

Halogen tutuvchi birikmalar



- Galogen atomlari.
- Reaktiv.
- Misol: xlorometan.

Boshqa organik birikmalar

- Nitro birikmalar ($-NO_2$)
- Tiollar ($-SH$)
- Sulfo kislotalar ($-SO_3H$)
- Efirlar, tioefirlar
- Aminokislotalar
- Polimerlar va boshqalar.

Muhim!

- ✓ Barcha sinflar uglevodorod zanjiriga turli funksional guruhlar qo'shilishi orqali hosil bo'ladi.
- ✓ Funksional guruh moddaning xossalarini belgilaydi.

Organik kimyo –
hayot bilan bog'laydi!





Mustahkamlash uchun topshiriqlar

Bilim –
barqaror kelajak
kafolati!



Organik
kimyo
qiziqarli!

1

Sinfini aniqlang

Quyidagi birikmalarni tegishli organik birikmalar sinfiga ajrating.

CH₄



C₂H₄



C₂H₂



C₂H₅OH



CH₃COOH



2

Davom ettiring

Quyidagi qatorlarni to'ldiring.

Alkan → to'yingan → C_nH_{2n+2}

Alken → to'yinmagan →

Alkin → to'yinmagan →

3

Funksional guruhni toping

Quyidagi funksional guruhlariga mos organik birikmalar sinflarini yozing.

–OH

–CHO

–COOH

–NH₂

4

Ortiqchasini toping

Qaysi birikma qatorida ortiqcha? Nima uchun?

CH₄



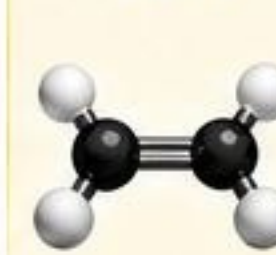
C₂H₆



C₃H₈



C₂H₄



Javob: _____

Nima uchun? _____

5

Taqqoslang

Alkan va alkenning 1 ta farqini yozing.

Alkan



Alken

6

Tezkor savol

Quyidagi birikmalar qaysi organik birikmalar sinfiga kiradi?

C₂H₅OH



CH₃COOH



CH₃NH₂



C₆H₆



Kimyo
hayotni
tushuntiradi!



Uyga vazifa

Mavzu: Organik birikmalarning sinflanishi



1 Organik birikmalar qanday asosiy sinflarga bo'linishini yozing.

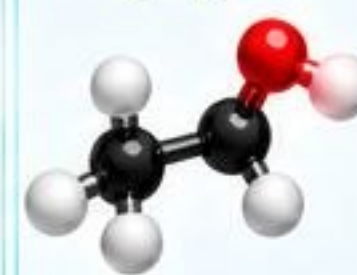
1. _____
2. _____
3. _____
4. _____
5. _____

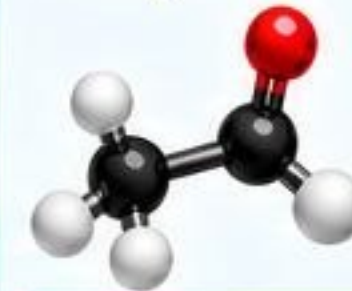
2 Quyidagi birikmalarning qaysi sinfga mansubligini aniqlang.

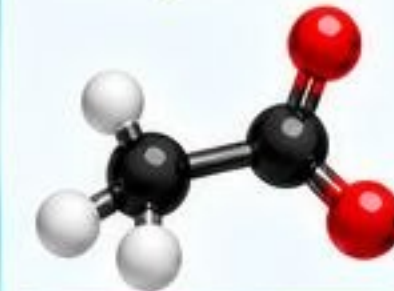












3 Quyidagi funksional guruhlar qaysi sinfga tegishli ekanini yozing.

-OH

-CHO

-COOH

-NH₂

4 Quyidagi uglevodorodlar sinflarining umumiy formulalarini yozing.

Uglevodorodlar sinfi

Umumiy formulasi

Alkanlar (to'yingan)

Alkenlar (to'yinmagan)

Alkinlar (to'yinmagan)

5 Ijodiy topshiriq

Kundalik hayotda uchraydigan 3 ta organik modda nomi va ishlatilishini yozing.

1. _____
2. _____
3. _____



Eslatma:

- ✓ Topshiriqlarni daftaringizda bajaring.
- ✓ Formulalarni to'g'ri yozing.
- ✓ Namunalarga o'xshash qilib, aniq va tartibli javob bering.

