#8 Sep Dropper 8am (MWF)
GOC / Isomerism

Intermediate Carbocation, Carbon Free Radical, Carbanion Stability and Acid Base Theory

Course on General Organic Chemistry for Class XI

SURENDRA K MISHRA • Lesson 16 • Sept 2, 2021

NUCLEUS EDUCATION
Centre of Excellence

unacademy

IIT - ORGANIC CHEMISTRY

NURTURE

Corporate Office: NAIVEDHYAM, Plot No. SP-11, Old INOX, Indra Vihar,
Kota (Raj.) 324005

DPP # 04

Time : 30 Min.

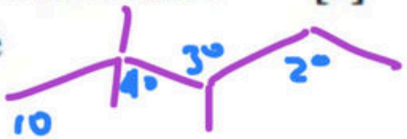
1. C_5H_{12} has a symmetrical structure with one quaternary carbon. Its IUPAC name is : **[3]**

(A) n-pentane (B) 2-methylbutane (C) 2,2-dimethylpropane (D) 3-methylbutane

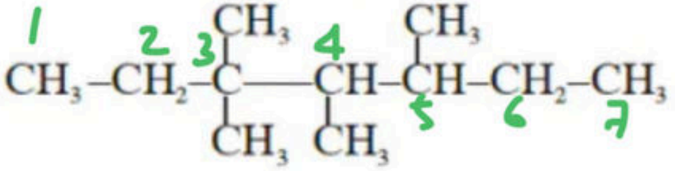
2. Which of the following compound has all four type (1°,2°,3°, 4°) of carbon atoms : **[3]**

(A) 2,3,4-Trimethylpentane (B) 2,2,3-Trimethylpentane

(C) neo-pentane (D) none of the three



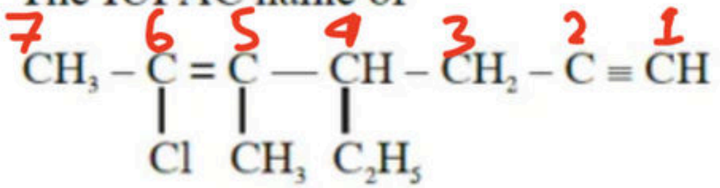
3. In following compound **[3]**



The correct lowest set of locant is :

(A) 3,3,4,5 (B) 3,4,5,5 (C) 4,5,3,3 (D) 5,5,4,3

4. The IUPAC name of [3]

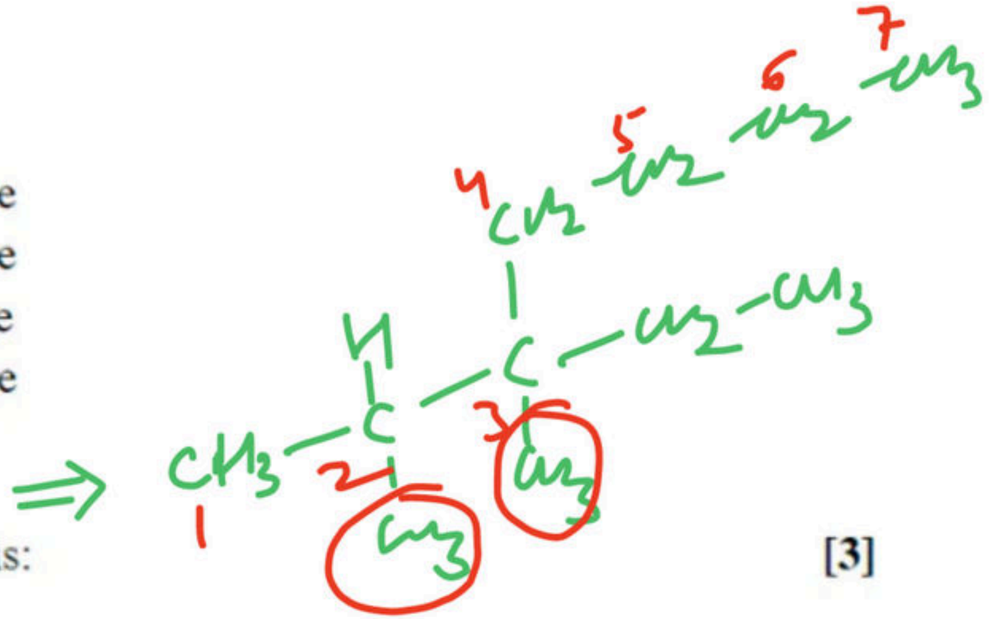


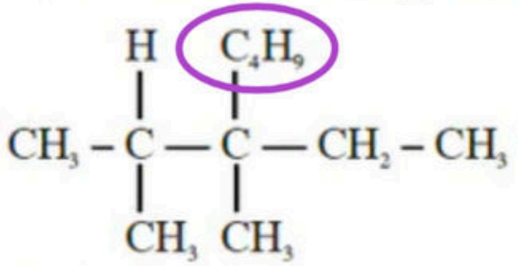
(A) 2-Chloro-4-ethyl-3-methyl-6-heptyn-2 ene

(B) 2-Chloro-4-ethyl-3-methyl-2-heptyn-6 yne

(C) 6-Chloro-4-ethyl-5-methyl-1-heptyn-5 ene

(D) 6-Chloro-4-ethyl-5-methyl-5-hepten-1 yne



5. IUPAC name of  is: [3]

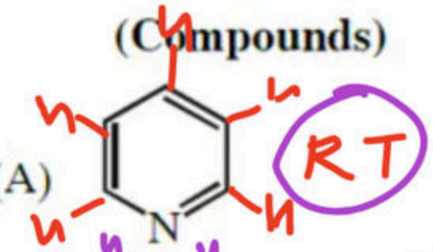
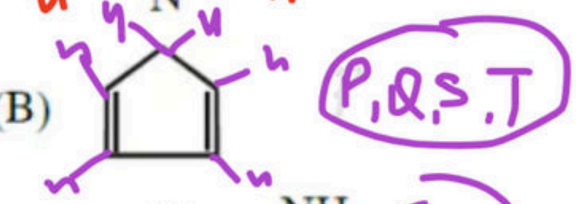
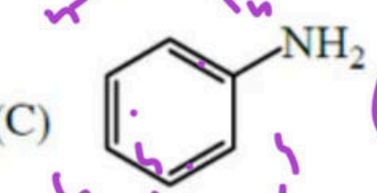
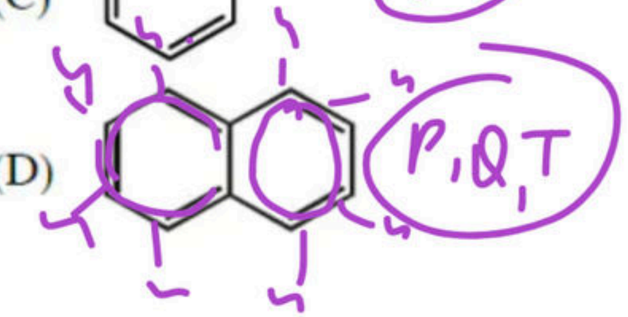
(A) 3,4,4- Trimethylheptane

(B) 4-Ethyl-3,4-dimethyl octane

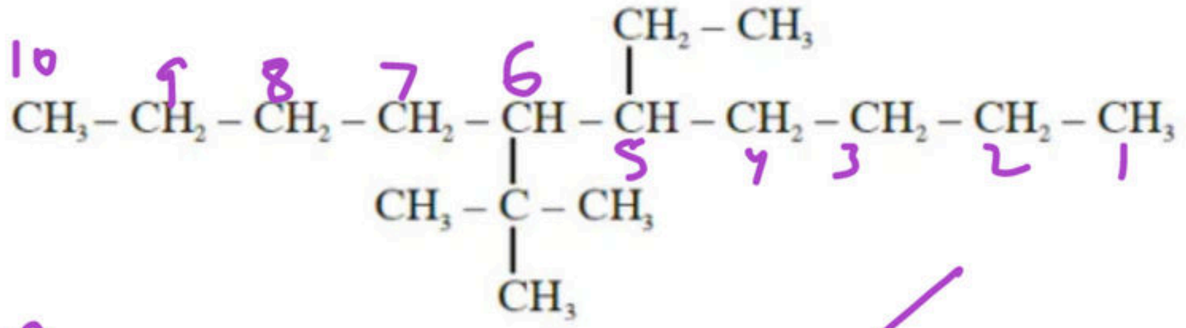
(C) 2-Butyl-2-methyl-3-ethylbutane

(D) None of these

6. Match the column: **[3]**

Column I (Compounds)		**Column II (Property)**
(A)		(P) Homocyclic compound
(B)		(Q) Homocyclic hydrocarbon
(C)		(R) Heterocyclic
(D)		(S) Even number of π-bond
		(T) Odd number of σ-bond

4-chloro-3-chloroEthynyl-3-ethyl Pent-1-enoic Acid.

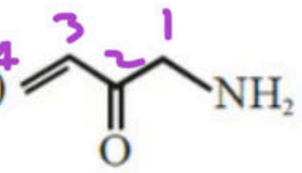
7.  [3]

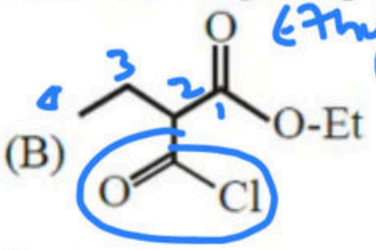
(A) 5-(1, 1-Dimethyl Ethyl)-6-Ethyl decane (B) 5-Ethyl-6-(1, 1-Dimethyl Ethyl) decane
(C) 6-Ethyl-5-(1, 1-Dimethyl Ethyl) decane (D) 6-(1, 1-Dimethyl Ethyl)-5 Ethyl decane

8. IUPAC name of $CH_3 - CH = CH - C \equiv CH$ is: [3]

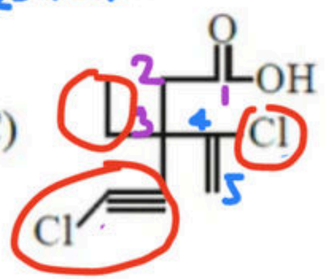
(A) 2-Penten-4-yne (B) 1-Pentyn-3-ene (C) 3-Penten-1-yne (D) None of these

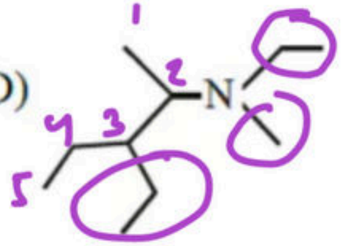
9. Provide IUAPC name of the following compounds : [3]

(A) 

(B) 

Ethyl-2-chloro Carbonyl Butanoate.

(C) 

(D) 

3,N-Di Ethyl-N-methyl Pentan-2-amine

1-Amino But-3-en-2-one

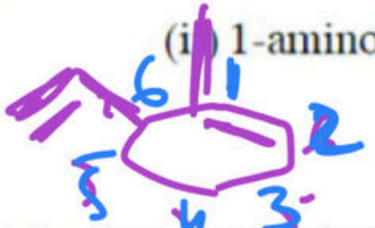
vinyl ⇒ $\mathrm{CH=CH_2}$

10. Write correct IUPAC names of following compounds **[3]**

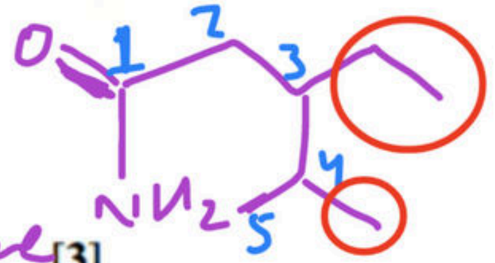
(i) 2-Ethyl-5-hexyne

(ii) 1-amino-3-isopropylpentan-1-one

(iii) 1-methyl-2-vinyl cyclohex-1(6)-ene



6-Ethenyl
1-Methyl
Cyclohexene

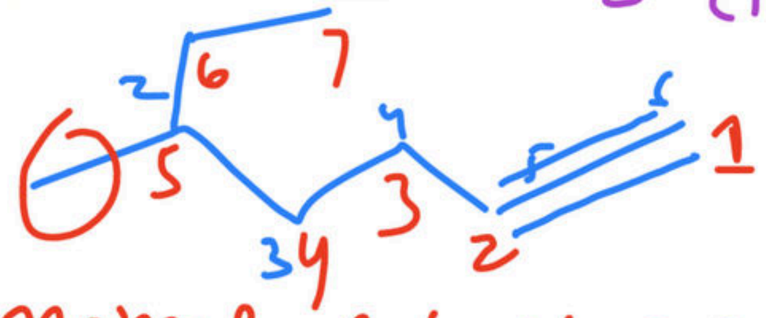


3-Ethyl-4-Methyl Pentanamide

11. The IUPAC name of the crotonaldehyde is: (CH_3–CH = CH–CHO) is **[3]**

(A) 2-Propenal (B) Propenal (C) 2-Butenal (D) Butenals

2-Ethyl-5-hexyne



5-Methyl-1-heptyne

NUCLEUS EDUCATION
Centre of Excellence

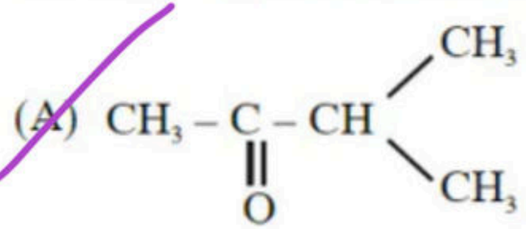
unacademy

IIT - ORGANIC CHEMISTRY

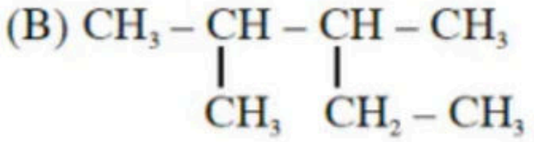
NURTURE

Corporate Office: NAIVEDHYAM, Plot No. SP-11, Old INOX, Indra Vihar,
Kota (Raj.) 324005

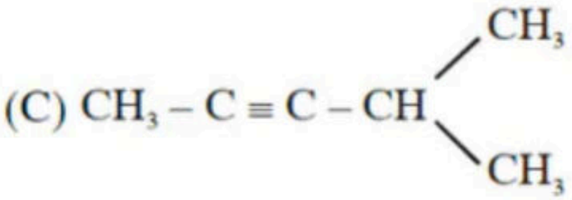
1. The incorrect IUPAC name is: **[3]**

(A) 

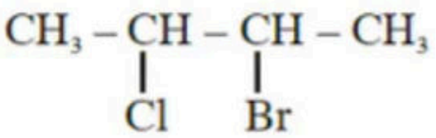
2-Methyl-3-butanone

(B) 

2,3-Dimethylpentane

(C) 

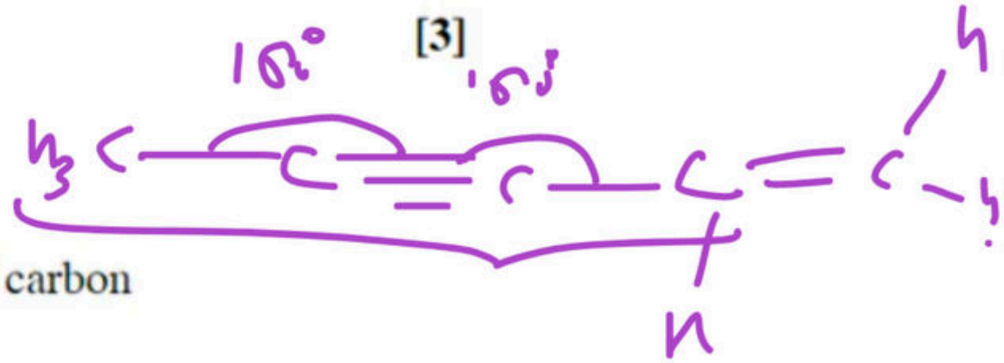
4-Methyl-2-pentyne

(D) 

3-Chloro-2-bromobutane

2. Find out the correct statement(s) about given molecule. **[3]**

$$CH_3 - C \equiv C - CH = CH - CH = CH_2$$



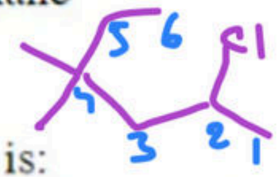
(A) All the carbons in given molecule are not in same plane

(B) IUPAC name is hepta-1,3-dien-5-yne

(C) It has 4 sp^2 hybrid carbons, 2 sp hybrid carbons and 1 sp^3 hybrid carbon

(D) All the carbons in given molecule are in same plane

3. IUPAC name of given organic compound: **[3]**



$(CH_3)_2C(CH_2CH_3)CH_2CH(Cl)CH_3$ is:

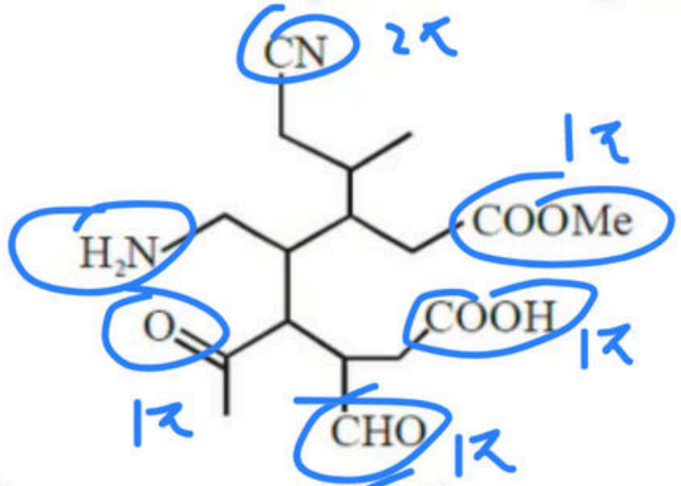
(A) 5-Chloro-3,3-dimethylhexane

(B) 5-Chloro-2-ethyl-2-methylpentane

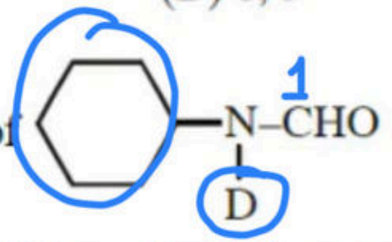
(C) 2-Chloro-4-ethyl-4-methylpentane

(D) 2-Chloro-4,4-dimethylhexane

4. Number of functional groups and double bond equivalent are respectivily. **[3]**

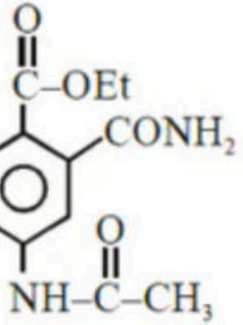


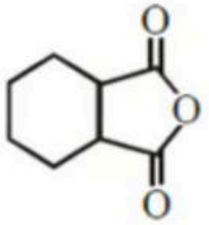
(A) 6, 1 (B) 6, 5 (C) 6, 6 (D) 6, 7

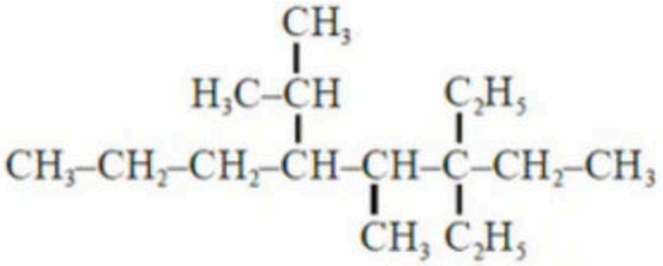
5. IUPAC name of  is **[3]**

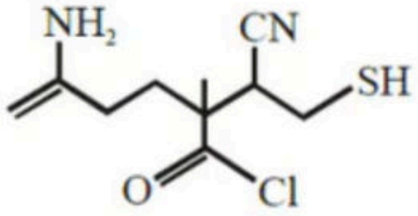
(A) N-deutero-N-formylcyclohexanamine (B) N-cyclohexylamino-N-deuteromethanal
(C) N-cyclohexyl-N-deuteromethanamide (D) N-deutero cyclohexanaminal

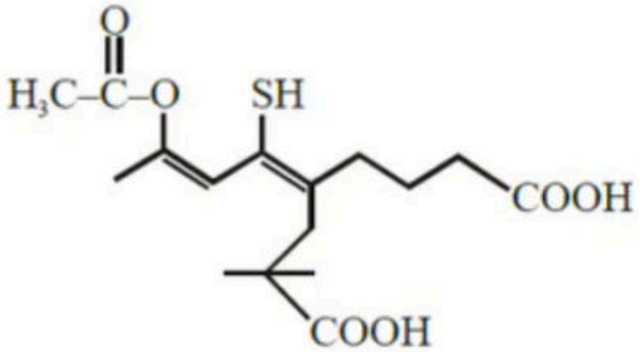
6. Provide the IUPAC name of following compounds : **[5]**

1. 

2. 

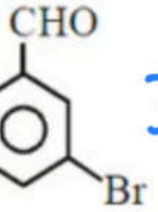
3. 

4. 

5. 

6. 

1,3 epoxy Propane

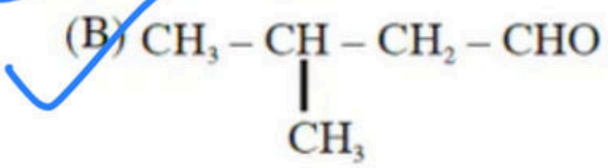
7. 

3-Bromo Benzaldehyde

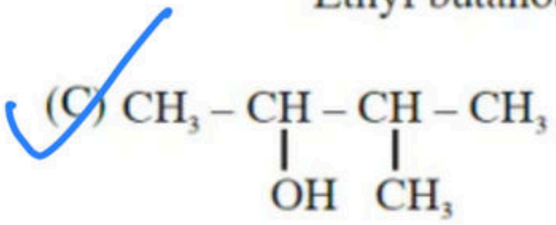
7. Which of the following compound has wrong IUPAC name? **[3]**

(A) $CH_3 - CH_2 - CH_2 - COOCH_2CH_3$

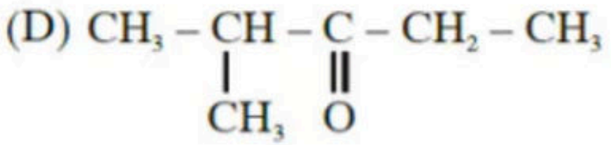
Ethyl butanoate

(B) 

3-Methylbutanol

(C) 

2-Methyl-3-butanol

(D) 

2-Methyl-3-pentanone

(#) Theory Copy :-

DPP = 6.7

HOC

(1) 3 > 2 > 1

(2) 1 > 2

(3) 2 > 1

(4) 3 > 1 > 2

(5) 1 > 2

Resource shift

(6) 4 > 3 > 2 > 1

(7) 4 > 3 > 2 > 1

* (8) 1 > 2 > 3 > 4

(9) 2 > 1

(10) 2 > 1

Stability of Intermidiate

(4) $3^\circ > 2^\circ > 1^\circ$ (+I effect)

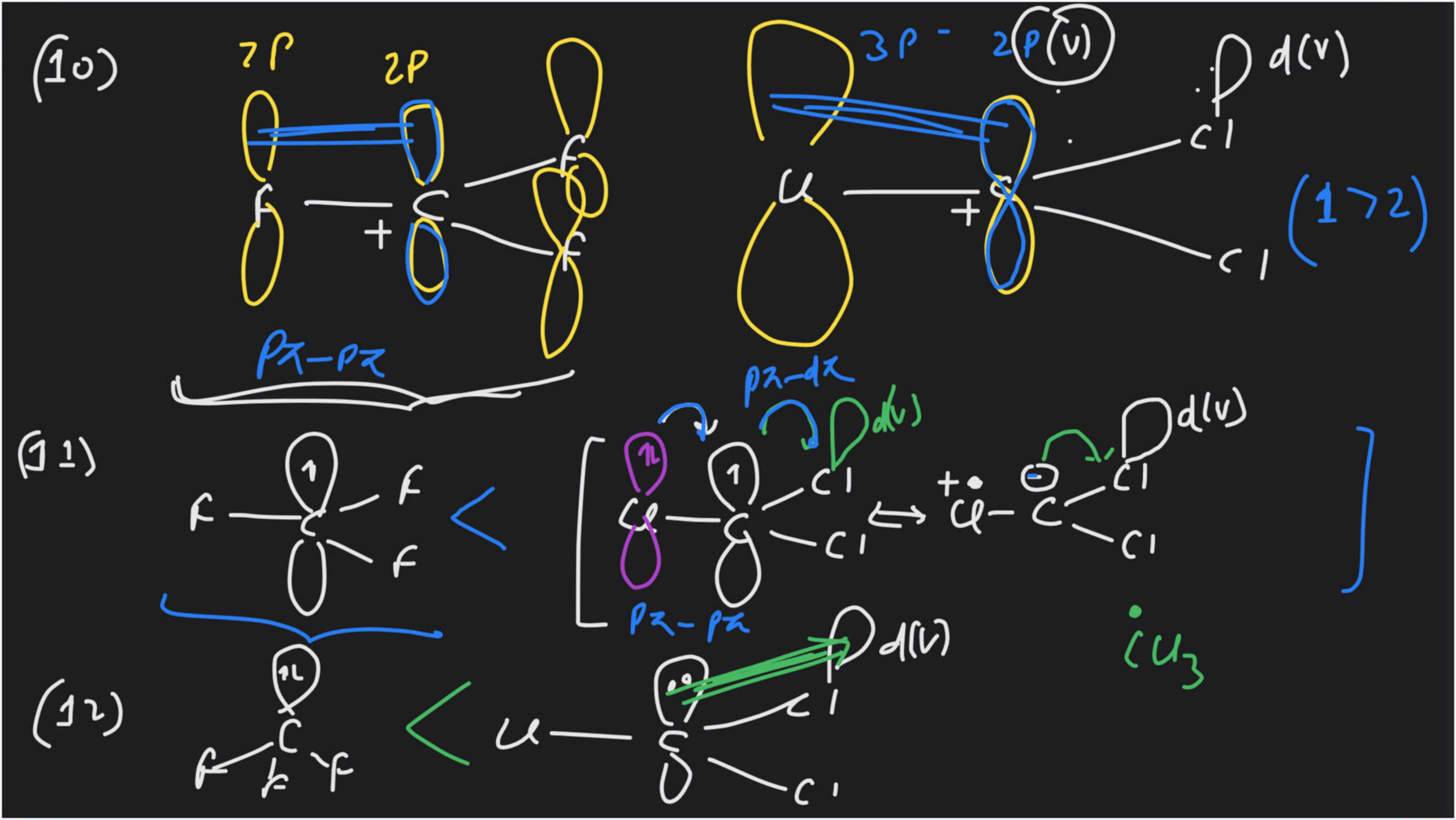
(5) $3^\circ > 2^\circ > 1^\circ$ (")

(6) $1^\circ > 2^\circ > 3^\circ$ ($\frac{1}{+I}$)

(7) $1^\circ > 2^\circ > 3^\circ$ (+M effect Stupth) $\quad C-H > C-D > C-T$

(8) $1^\circ > 2^\circ > 3^\circ$ (———)

(9) $CH_2-CH_3 > CH_2-CD_3 > CH_2-CT_3$ $\left(\frac{1}{+I}\right)$ $\overset{+I}{(CT_3 > CD_3 > CH_3)}$


(10)
2P
2P
pπ–pπ
3P
2P(V)
d(V)
Cl
Cl
(1>2)
pπ–dπ
d(V)
(11)
F
F
F
F
π
π
Cl
Cl
Cl
Cl
d(V)
pπ–pπ
(12)
F
F
d(V)
Cl
Cl
iU3

(13) $CH_3-\overset{\oplus}{C}H_2$ $CH_2=\overset{\oplus}{C}H$ $HC\equiv\overset{\oplus}{C}$ — SP(v)

Singly Bonded Carbon

doubly Bonded Carbon

Triply Bonded Carbon

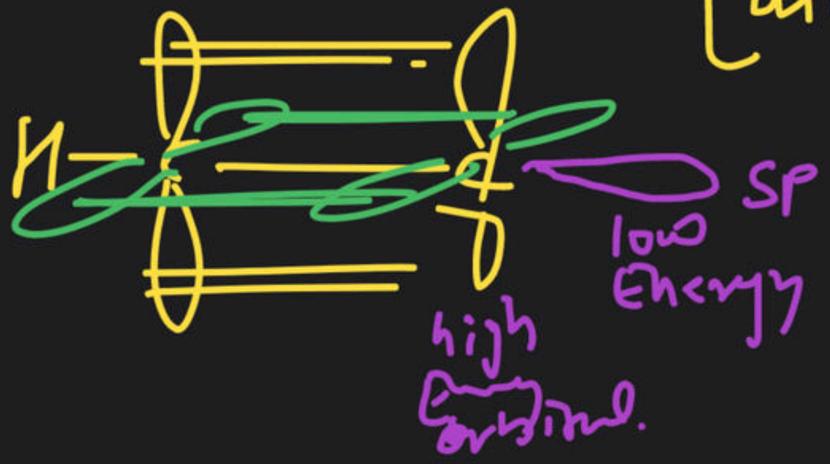
Stability

hybrid orbital > unhybrid orbital

Energy

unhybrid orbital > hybrid orbital.

1 > 2 > 3



(14) 1 > 2 > 3

(15) (3 > 2 > 1)

$HC\equiv\overset{\ominus}{C}$ — SP

SP ⇒ % S character ∝ En

(16) 2 > 1 (Res)

(17) 2 > 1 (11)

(18) 2 > 1 (11)

(19) 2 > 1 (11)

(20) 2 > 1 (111)

(21) 2 > 1 (111)

(25) 3 > 1 > 2 (+11)
7 24 3 24 1 24

(27) 2 > 1 > 3 ($\frac{1}{+E}$)

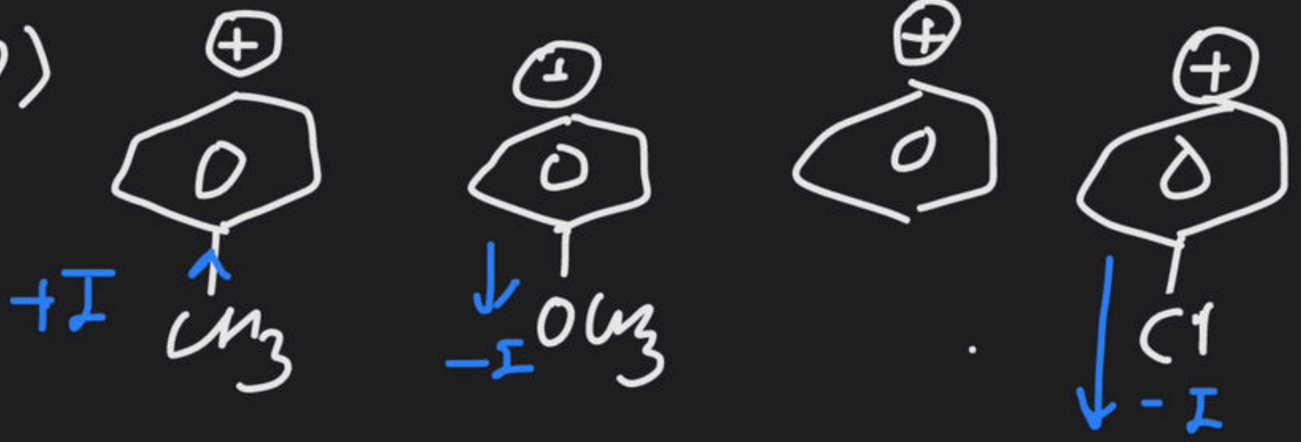
(26) 3 > 1 > 2 (+11)

(28) 2 > 3 > 1 (+11)

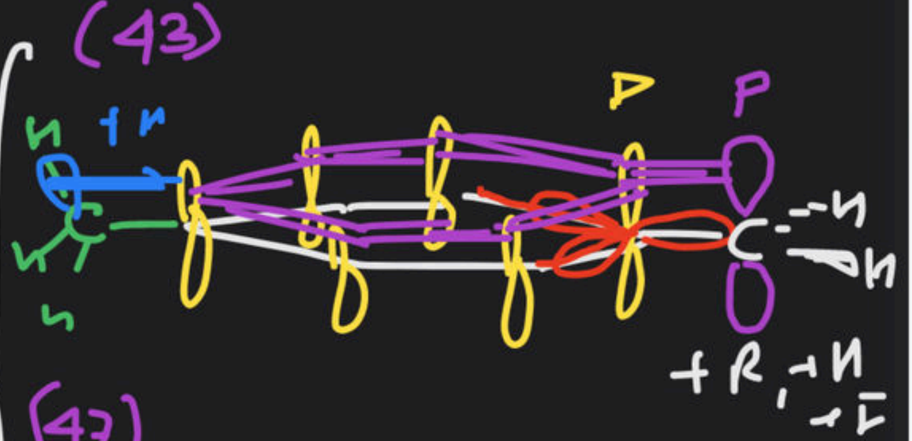
(29) 2 > 3 > 1 (11)

(30) 1 > 3 > 2 ($\frac{\not\equiv 1}{+E}$)

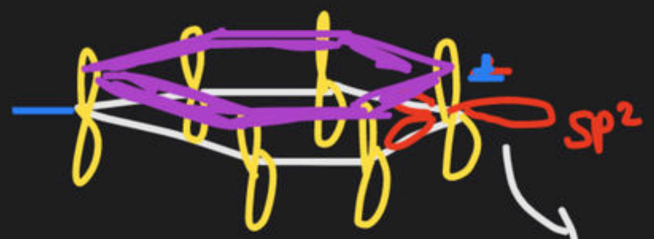
(47)



(43)



(47)



affected by only Inductive effect

(A) 1 > 2 > 3 > 4

(B) 4 > 3 > 2 > 1

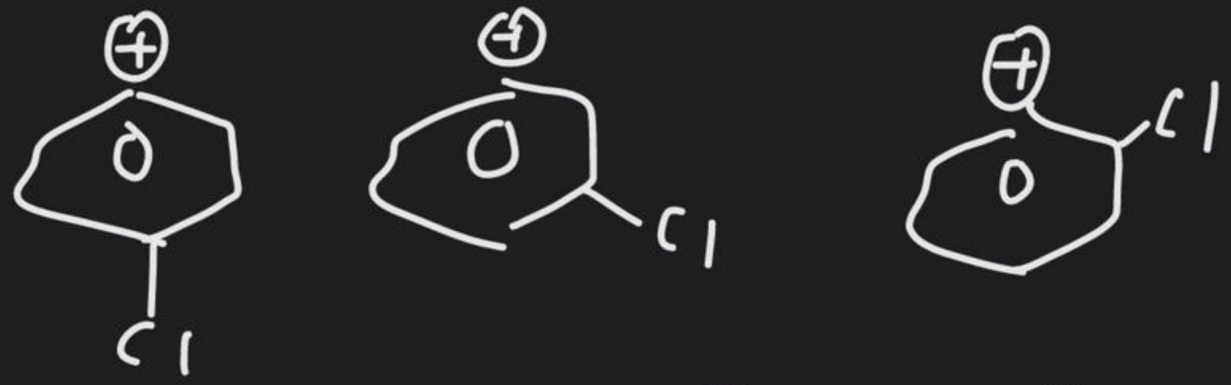
(C) 1 > 3 > 2 > 4

(D)

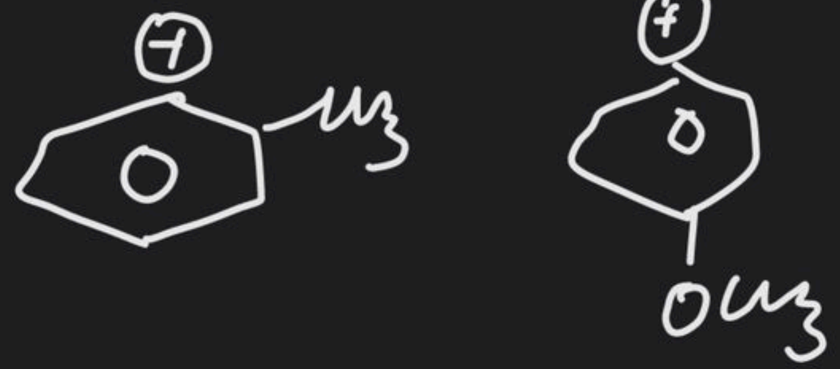
N.O.T

(40)

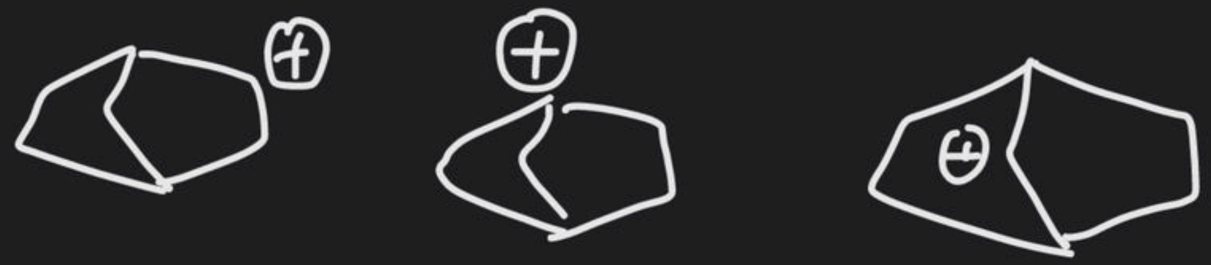
(49)



(50)

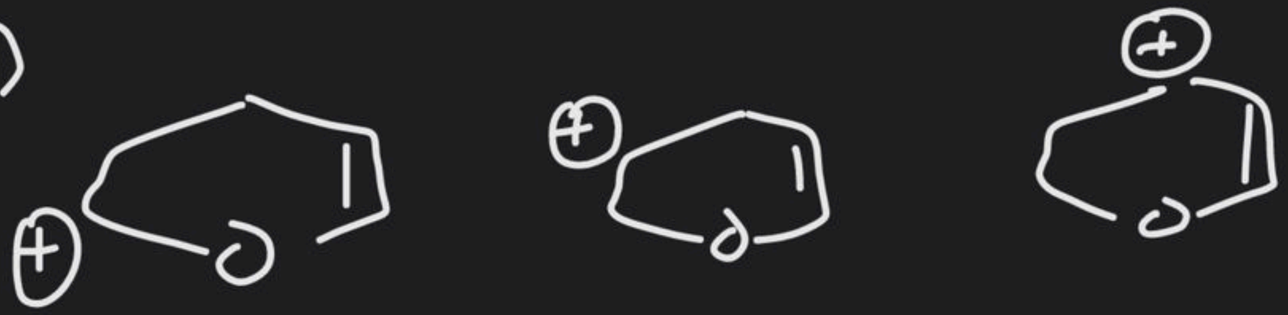


(51)



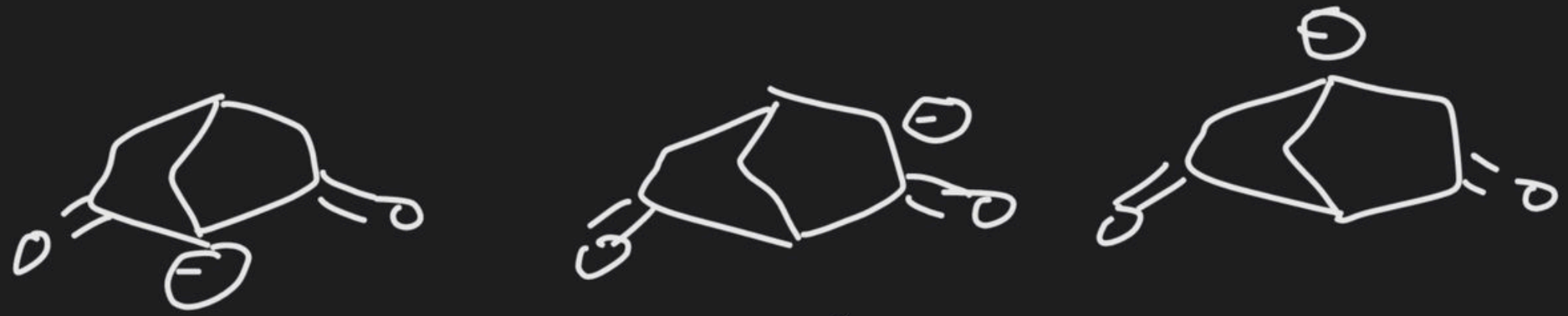
(52)

(53)



(54)

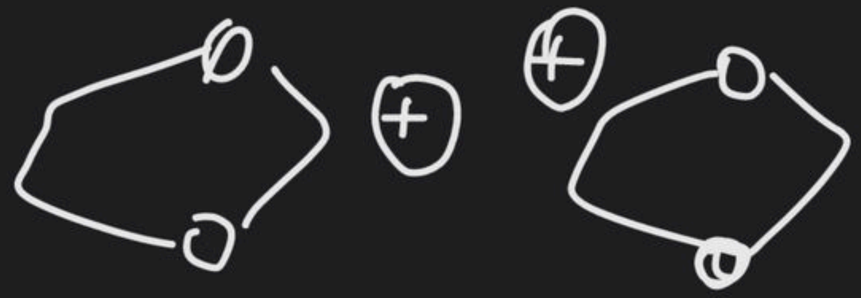
(55)



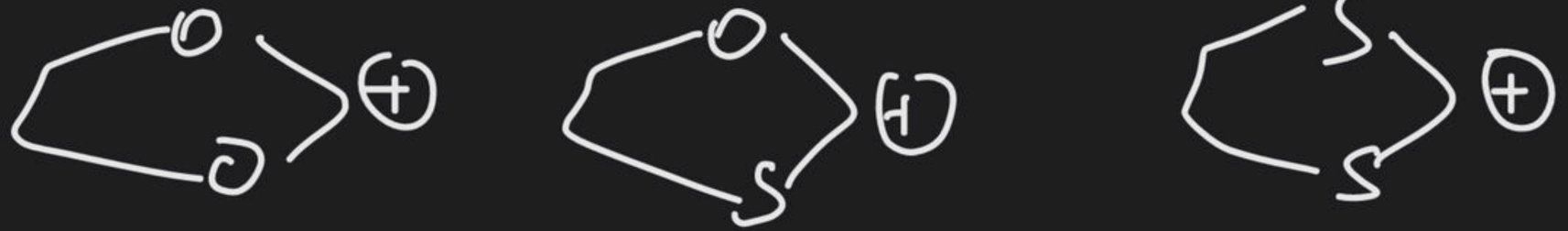
(56)

(57)

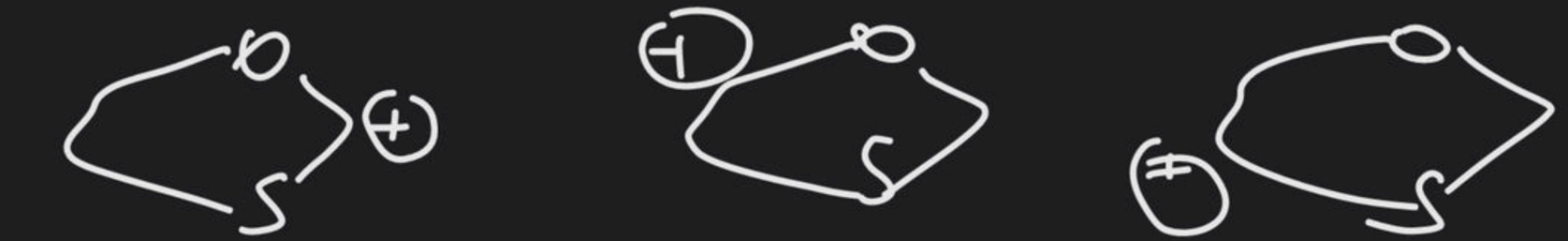
(58)



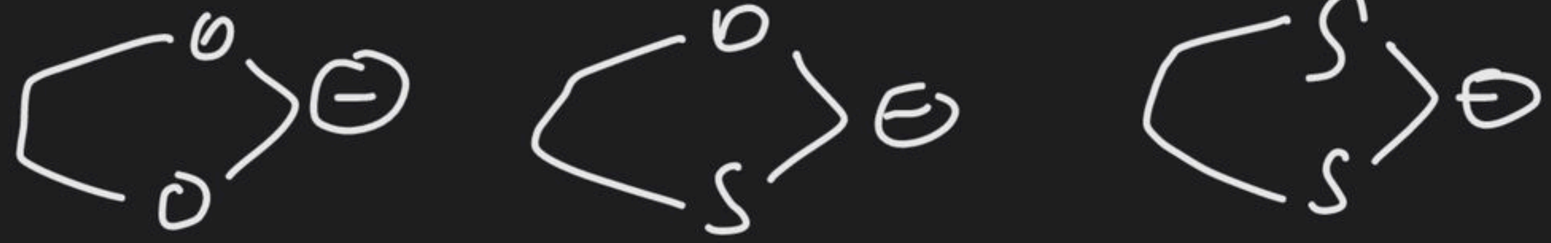
(59)



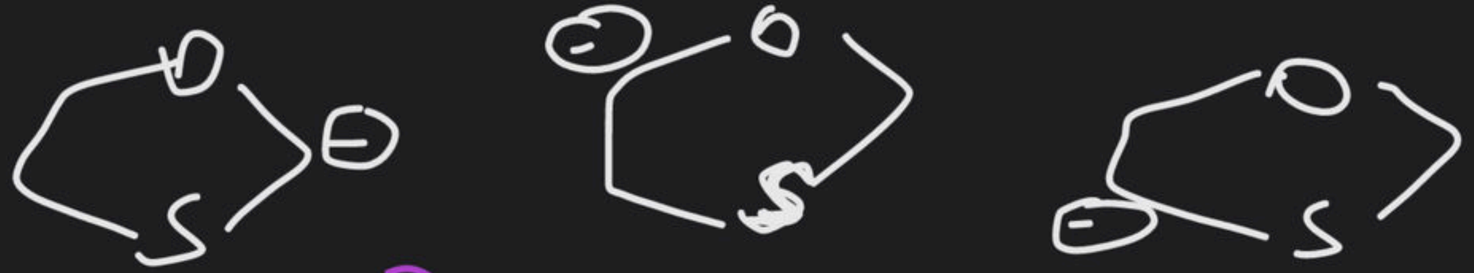
(60)



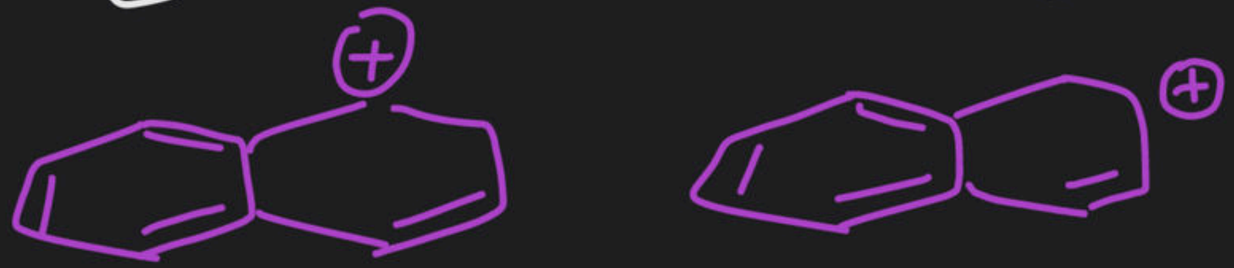
(61)



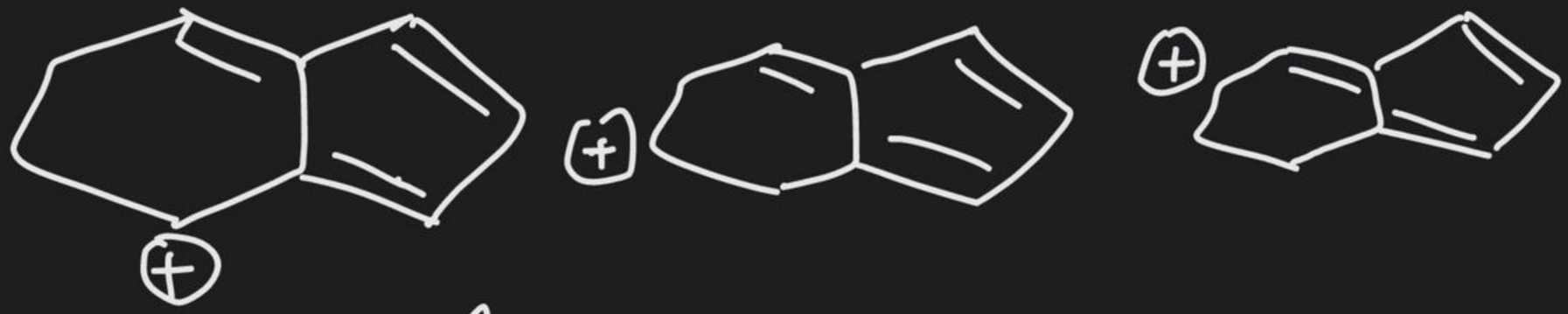
(62)



(63)



(64)



(65) Anion

Aromaticity

⇒ is ability of dispersion of πe^- density to have stability.

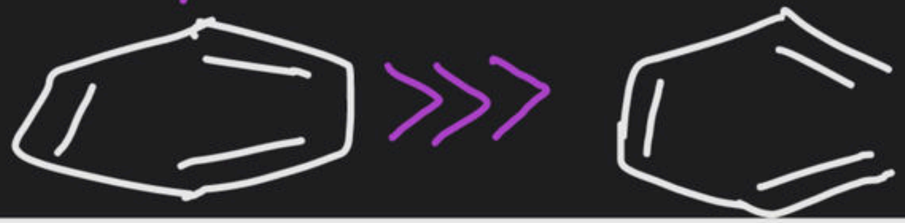
Aromatic Compound

⇒ Compounds obtained on fractional distillation of coal-tar having characteristic aroma are known as aromatic compound.

⇒ All cyclic compounds which are unusually highly stable than its open chain analogues form.

are known as aromatic Compound.

(Stability)



Condition for a Compound to be Aromatic

Compound must

(a) be cyclic

(b) be planer (each cyclic atom must have p-orbital) — " "

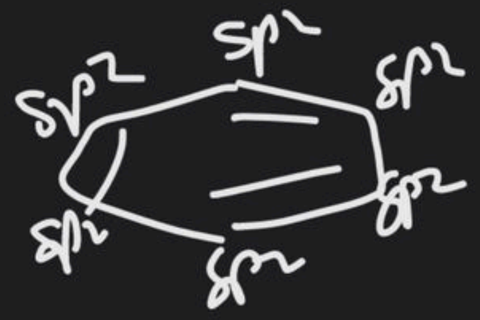
(c) be Conjugated (each C atom is either sp/sp^2)

(d) have $(4n+2)$ no. of peripheral (π e⁻s (largest Conjugated periphery)

where $n = 0, 1, 2, 3 - - - - - -$

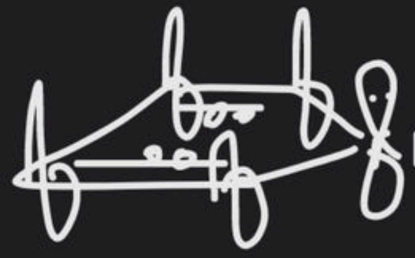
This is known Huckle's Rule.

Huckle Number 2, 6, 10, 14 - - - - - - - - -



Cyclic ✓
Planes ✓
Conjugated ✓

Aromatic



H_{N1} = 3 π Bond = 6 π e⁻s

✓ ✓ ✓

$H_N = 6$

Aromatic