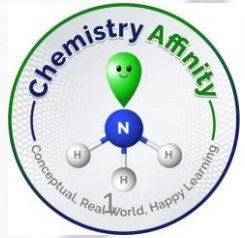
Electrophilic Aromatic Substitution

Objective questions based on NEET, JEE (Main), IISER Aptitude Test

Chemistry Affinity
Conceptual, Real world, Happy Learning

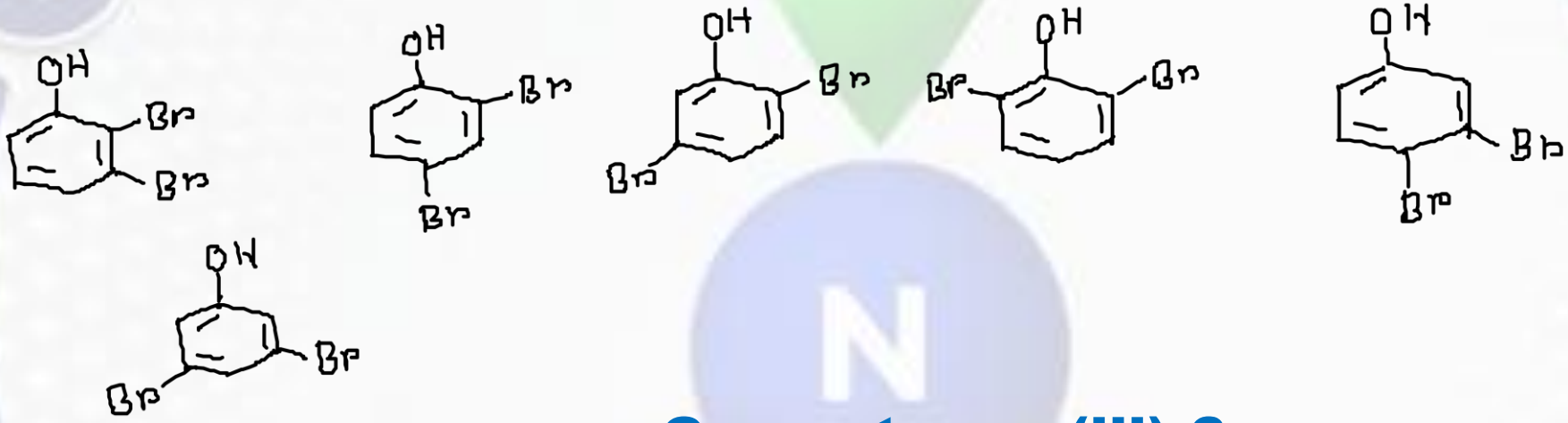


1.The aromatic compound must be ....., ... contain alternating double and single bonds and have a pi ..... electrons

(i) noncyclic, coplanar, even number
(ii) Cyclic, symmetric, odd number
(iii)Cyclic, planar, Huckel (4n+2)pi electrons
(iv)Cyclic, aliphatic, Huckel (4n+2)pi electrons

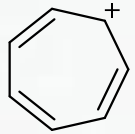
Correct ans: (iii) Cyclic, planar, Huckel (4n+2)pi electrons

2. How many different dibromophenols are possible: (i) 8, (ii) 7, (iii) 6, (iv) 5

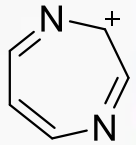


Correct ans: (iii) 6

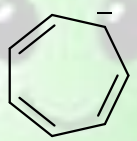
3.Which of the following molecules would you expect to be antiromatic?



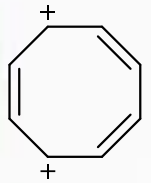
I



II

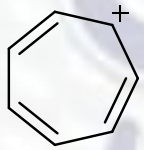


III



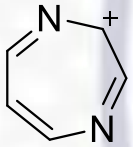
IV

Correct ans: (iii)



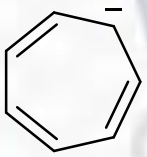
I

6Π electrons: (4n+2) Π electrons; n = 1, so aromatic



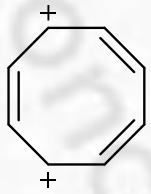
II

6Π electrons: (4n+2) Π electrons; n = 1, so aromatic



III

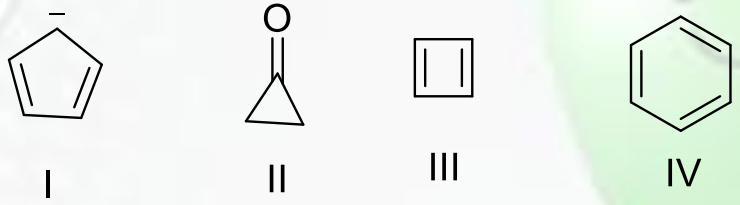
8Π electrons: 4n Π electrons; n = 2, conjugation is also present, so antiaromatic



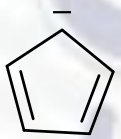
IV

6Π electrons: (4n+2) Π electrons; n = 1, conjugation missing, so non aromatic

4. Which of the following molecules would you expect to be antiaromatic?



Correct ans: (iii)



I

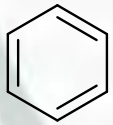
6Π electrons: (4n+2) Π electrons; n = 1, so aromatic

II

2Π electrons: (4n+2) Π electrons; n = 0, but conjugation missing, so non aromatic

III

4Π electrons: 4nΠ electrons; n = 1, conjugation so antiaromatic

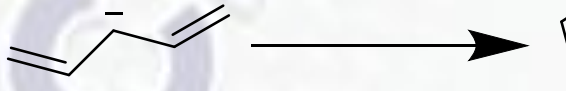


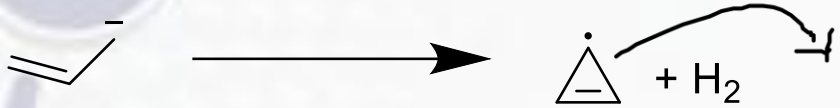
IV

6Π electrons: (4n+2) Π electrons; n = 1, so aromatic

5. Which cyclization should occur with decrease in pi electron energy??

(i)  → 4 π e ⇒ Anticaromatic

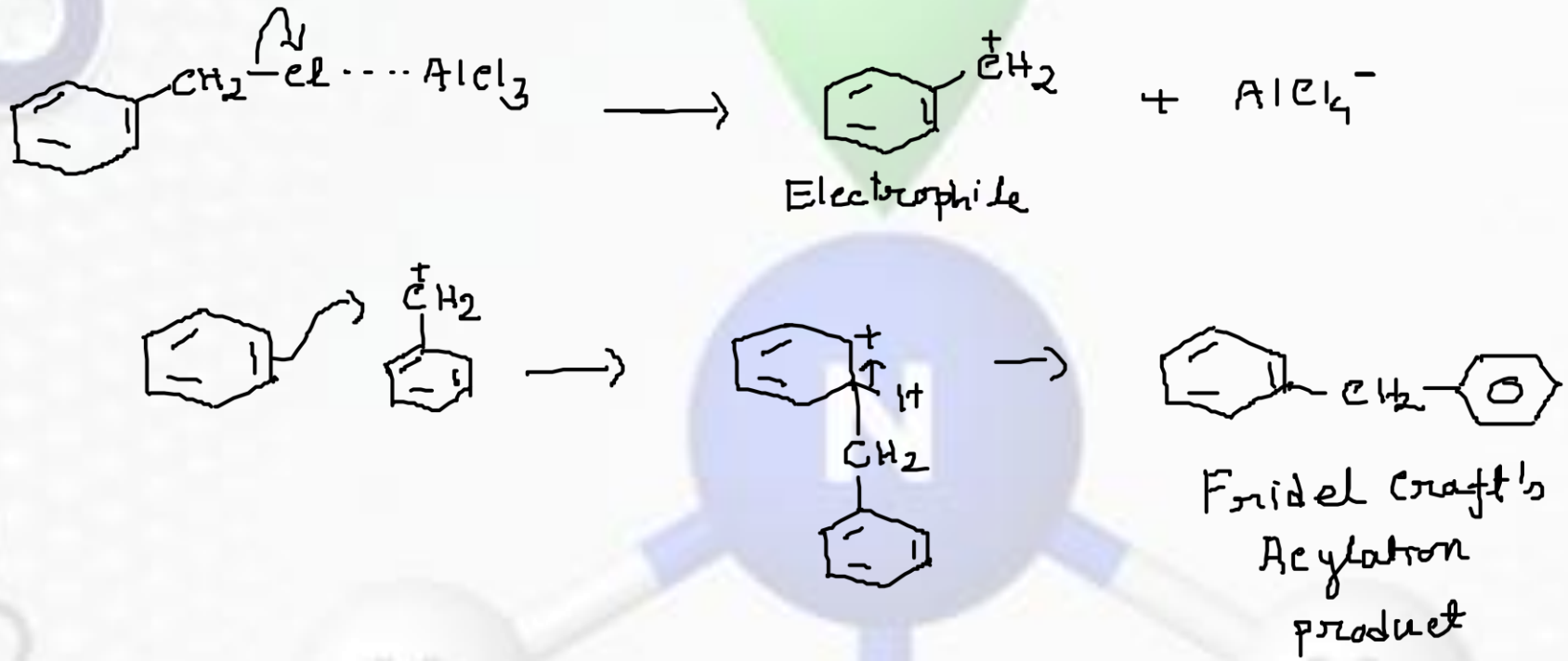
(ii)  → 6 π e ⇒ Aromatic

(iii)  → 3 π e ⇒ non-Aromatic

(iv)  → 4 π e ⇒ Anticaromatic

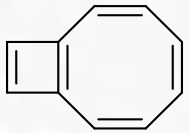
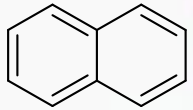
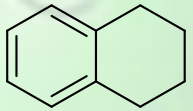
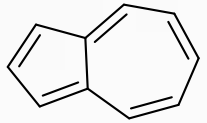
Correct option (ii)

6. In the Friedel crafts's acylation, the electrophile is
(i) $C_6H_5^+$, (ii) CH_3CO^-, (iii) $AlCl_4^-$, (iv) $C_6H_5CH_2^+$



Correct ans: (iv)

7. Of the following C10 compounds which is expected to possess the greatest resonance energy?

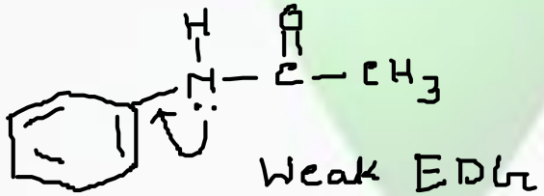
(i)  (ii)  (iii)  (iv) 

In simpler terms: Naphthalene's structure, with two fused benzene rings, is more symmetrical and uniformly aromatic, leading to greater stability. Azulene's structure, with the fused five- and seven-membered rings, is less symmetrical and results in a less stable, though still aromatic, molecule.

Correct ans: (ii)

8. Which of the following is not a meta directing group (i) $-NHCOCH_3$, (ii) $-NO_2$, (iii) $^+N(CH_3)$, (iv) –CN

Correct ans: (i) $-NHCOCH_3$

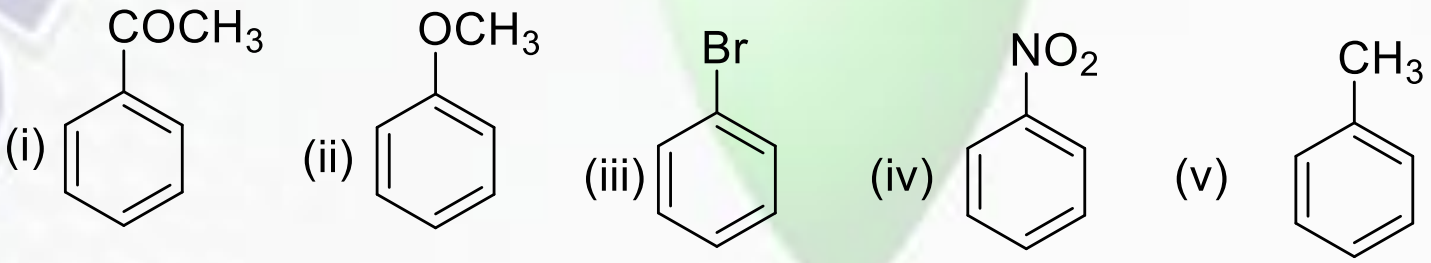


9. In electrophilic aromatic substitution the electrophile is a (i) neutral species(ii) carbocation, (iii) Lewis acid (iv) proton

Correct ans: (iii) Lewis acid

Electrophiles are electron deficient which accepts electrons, so they are Lewis acid

10. Arrange thw following compounds in order of decreasing reactivity in electrophilic substitution



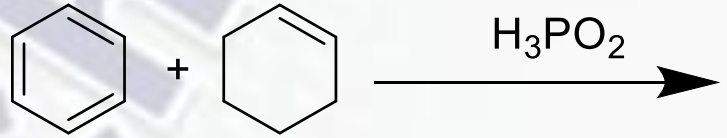
Reason: **NO_2 is a strongest electron withdrawing group (EWG), so it deactivates benzene ring strongly, reactivity will be least**

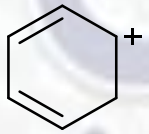
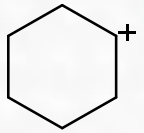
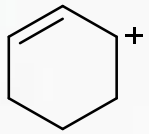
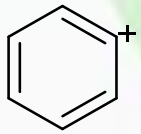
On the other hand, OCH_3 is an electron donating group (EDG), so it activates benzene ring , reactivity will be fastest

Order of electron withdrawing is $NO_2 > COCH_3 > Br > OCH_3$

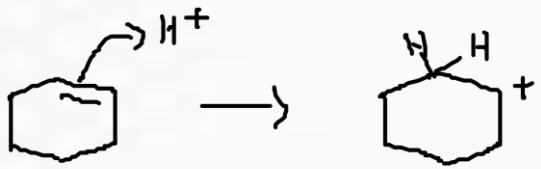
Correct ans: II > v > iii > I > iv

What is the electrophile in the following reaction?



(i)  (ii)  (iii)  (iv) 

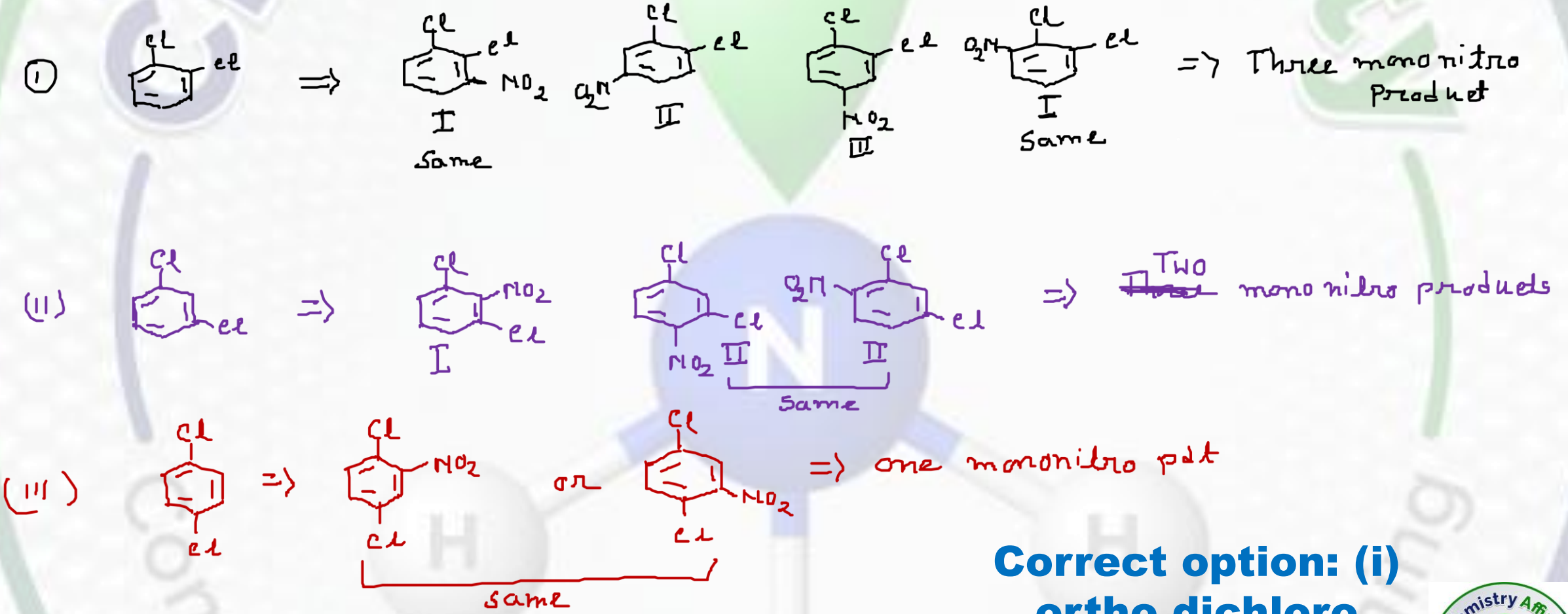
Correct ans: (ii)



Electrophile

correct option (ii)

12. Which dichlorobenzene may give three mononitro product?
(i) o-dichlorobenzene, (ii) m-dichloprobenzene, (iii) p-dichlorobenzene, (iv) All of these



Correct option: (i) ortho dichloro benzene