CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

ELECTRON MIGRATION EFFECTS

Example

1. Among chloroacetic acid and acetic , which is more acidic. Why ?

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2. Among ethylamine and ammonia , which is more basic. Why ?

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3. Write the resonance structures of crotonal-dehyle and indicate the stability order.

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4. Why the bond length of two C,O bonds in carboxylate ions are equal?

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5. In the which of the following compounds mesomerie effect is possible? Vinyl chloride , b) Allyl chloride and c) 3- Butenal

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6. Why toluene is more reactive than benzene towards electrophilic substitution reactions?

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7. Explain mesomeric and inductive effects present in vinyl chloride.

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8. $C_1 - C_2$ Bond length in propene is $1.46A^\circ$ and $C_2 - C_3$ bond length is $1.36A^\circ$. Explain.

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9. What is the stability order of various alkyl free radicals ? Why?

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10. What is ring - chain tautomerism ?

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11. Among tertiary butyl and isopropyl carbon free radicals, why the first one is more stable ?

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12. What type of species are formed during homolysis of a covalent bond ?

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13. Identify electrophilic centre in the following . RCHO, RCH and CH_3X.

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Exercise 2 1 1

1. What do you understand by inductive effect ? IIlustrate your answer with two examples.

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2. Write a brief note on electromeric effect

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3. Explain mesomeric effect. Basing on it, explain the reactivity of phenol and benzaldehyde towards electrophilic subsitution reactions.

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4. Why the hyperconjugation effect exerted by a methyl group is greater than by an ethyl group ?

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Exercise 2 1 2

1. What are the main types of reaction intermediates?

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2. What are electrophiles ? Explain with two examples

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3. Mention any two nucleophiles. What is the necessary condition for a species to act as a nucleophile?

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4. What is a carbene? How is it formed? What is the hybridisation of carbon in carbene?

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5. Give an account of the main types of reactions in organic chemistry?

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Questions For Descriptive Answers

1. Hyperconjugation effect is also termed as 'no bond resonance'. Why?

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2. Explain why alkyl groups act as electron donors when attached to a π system.

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3. Separate nucleophiles and electrophiles from: $H_3O^+, RCOO^-, BF_3R-O-R, NH_3, R_3C^+$ and $ZnCI_2$.

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4. Classify the following reactions in one of the reaction type :

(i) $C_2H_5Br + {}^- OCH_3 \rightarrow C_2H_5OCH_3^- + Br^-$

(ii)

$$CH_3 - \underset{\underset{CH_3}{|}}{C} = \underset{\underset{CH_3}{|}}{C} - CH_3 + HBr \rightarrow CH_3 - \overset{\overset{H}{|}}{\underset{\underset{CH_3}{|}}{C}} - \overset{\overset{Br}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_3$$

(iii)

$$CH_3 - CH(Br) - CH_3 + OH^- \rightarrow CH_3 - CH = CH_2 + Br^-$$

(iv) $CH_2 = CH(OH) - CH_3 \rightarrow CH_3COCH_3$

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5. Why trichloro acetic acid is more reactive than acetic acid ?

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6. Among the ions, $O_2NCH_2CH_2O^-$ and $CH_3CH_2O^-$, which is more stable ? Why?

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7. $C_2H_5^+$ is more stable than CH,+. Substantiate ?

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8. What type of reaction is involved in the conversion of ammonium cyanate to urea.

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9. Halogen causes –I effect, buit with lone pairs they have +M effect. Substantiate.

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10. Phenol is more acidic and ethanol is less acidic than water. Why ?

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