

Question 82. Match the reactions given in column I with the types of reactions given in column II.

Column I		Column II
(i)	$\text{C}_6\text{H}_5\text{Cl} \xrightarrow{\text{Fe}/\text{Cl}_2} \text{C}_6\text{H}_4\text{Cl}_2 + \text{C}_6\text{H}_4\text{Cl}_2$	(a) Nucleophilic aromatic substitution
(ii)	$\text{CH}_3-\text{CH}=\text{CH}_2 + \text{HBr} \longrightarrow \text{CH}_3-\underset{\text{Br}}{\text{CH}}-\text{CH}_3$	(b) Electrophilic aromatic substitution
(iii)	$\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{I} \xrightarrow{\text{OH}^-} \text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{OH}$	(c) Saytzeff elimination
(iv)	$\text{C}_6\text{H}_4(\text{Cl})(\text{NO}_2) + \text{NaOH} \longrightarrow \text{C}_6\text{H}_4(\text{OH})(\text{NO}_2)$	(d) Electrophilic addition
(v)	$\text{CH}_3\text{CH}_2\underset{\text{Br}}{\text{CH}}\text{CH}_3 \xrightarrow[\text{KOH}]{\text{alkaline}} \text{CH}_3\text{CH}=\text{CHCH}_3$	(e) Nucleophilic substitution ( $\text{S}_{\text{N}}1$ )

**Solution:** (i  $\rightarrow$  b), (ii  $\rightarrow$  d), (iii  $\rightarrow$  e), (iv  $\rightarrow$  a), (v  $\rightarrow$  c)

(i) In this reaction, an electrophile  $\text{Cl}^+$  attacks on to the benzene ring and substitution takes place.

(ii) In this reaction, addition of  $\text{HBr}$  takes place on to the doubly bonded carbons of propene in accordance with Markownikoff's rule and electrophilic addition takes place.

(iii) In this reaction, the reactant is secondary halide. Here, halogen atom is substituted by hydroxyl ion. As it is secondary halide so it follows  $\text{S}_{\text{N}}1$  mechanism.

(iv) In this reaction, halogen atom is directly bonded to aromatic ring. So, it is nucleophilic aromatic substitution as  $\text{OH}^-$  group has substituted halogen of given compound.

(v) It is an elimination reaction. It follows Saytzeff elimination rule.