

## Types of Organic Reactions

Reagent / Reaction Type	Nucleophilic	Electrophilic	Radical
<b>Substitution</b> $R-X + Y \rightarrow R-Y + X$	Alkyl halides + Cyanide ion or hydroxide ion $R-Br + \overset{\ominus}{C}N \rightarrow R-CN + Br^{\ominus}$	Benzene electrophilic substitution 	Halogenation of methane UV light $CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$
<b>Addition</b> $C=C + XY \rightarrow C(X)-C(Y)$	$C=O + H^+ \rightarrow C(OH)-H$	Alkene + HBr $C=C + H^+ + Br^{\ominus} \rightarrow C(H)-C(Br)$	
<b>Elimination</b> $C(X)-C(Y) \rightarrow C=C + XY$	$C(H)-C(Br) + OH^{\ominus} \rightarrow C=C + Br^{\ominus} + H_2O$	Alcohol + H <sup>+</sup> acid catalysed elimination $C(H)-C(OH) + H^+ \rightarrow C=C + H_2O$	Thermal cracking of alkanes decane, C <sub>10</sub> H <sub>22</sub> → octane, C <sub>8</sub> H <sub>18</sub> + ethene, C <sub>2</sub> H <sub>4</sub>

## Qualitative Analysis of functional groups

