SPM Special Chemical Equations

1 Catalytic Reactions You Should Know

(1) $\mathrm{C}_n\mathrm{H}_{2n} + \mathrm{H}_2 \xrightarrow[200\,^\circ\mathrm{C}]{\mathrm{Ni}} \mathrm{C}_n\mathrm{H}_{2n+2}$ (Hydrogenation)

(2) $\mathrm{Vege\,Oil} + \mathrm{H}_2 \xrightarrow[200\,^\circ\mathrm{C}]{\mathrm{Ni}} \mathrm{Marg}$

(3) $\mathrm{Zn} + \mathrm{H_2SO_4} \xrightarrow{\mathrm{CuSO_4}} \mathrm{ZnSO_4} + \mathrm{H_2}$

(4) $2\,\mathrm{H_2O_2} \xrightarrow{\mathrm{MnO_2}} 2\,\mathrm{H_2O} + \mathrm{O_2}$

(5) $\mathrm{NaOCl} \xrightarrow{\mathrm{MnO_2}} 2\,\mathrm{NaCl} + \mathrm{O_2}$

(6) $\mathrm{N_2} + 3\,\mathrm{H_2} \rightleftharpoons[\mathrm{Fe}] 2\,\mathrm{NH_3}$ (Haber process)

(7) $2\,\mathrm{SO_2} + \mathrm{O_2} \rightleftharpoons[\mathrm{V_2O_5}] 2\,\mathrm{SO_3}$ (Contact process)

(8) $4\,\mathrm{NH_3} + 5\,\mathrm{O_2} \rightleftharpoons[\mathrm{Pt}] 4\,\mathrm{NO} + 6\,\mathrm{H_2O}$ (Ostwald process)

(9) $\mathrm{HCl} \xrightarrow{\mathrm{H_2O}} \mathrm{H^+} + \mathrm{Cl^-}$ (Ionisation)

(10) $\mathrm{MnO_2} + 4\,\mathrm{HCl} \xrightarrow{\Delta} \mathrm{MnCl_2} + \mathrm{Cl_2} + 2\,\mathrm{H_2O}$ (Chlorine gas)

(11) $\mathrm{NaCl} + \mathrm{H_2SO_4} \xrightarrow{\Delta} \mathrm{NaHSO_4} + \mathrm{HCl}$ (Hydrogen chloride)

2 Organic Chemical Reactions You Should Know

$$\mathrm{X} + \mathrm{O_2} \xrightarrow{\Delta} \mathrm{CO_2} + \mathrm{H_2O} \qquad \text{(Combustion)}$$

$$\mathrm{Cl_2} + \mathrm{H{-}\underset{\mathrm{H}}{\overset{\mathrm{H}}{\overset{|}{\underset{|}{\mathrm{C}}}}}{-}H} \xrightarrow{\mathrm{UV}} \mathrm{H{-}\underset{\mathrm{H}}{\overset{\mathrm{H}}{\overset{|}{\underset{|}{\mathrm{C}}}}}{-}Cl} + \mathrm{HCl} \qquad \text{(Halogenation)}$$

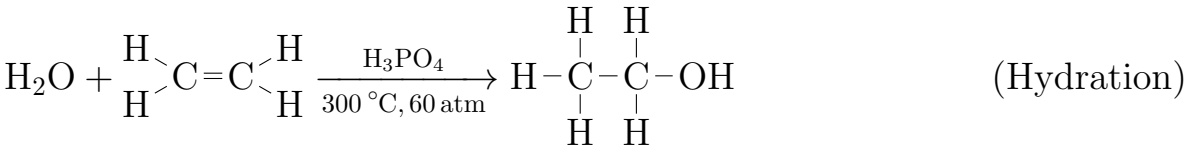
$$\mathrm{Cl_2} + \mathrm{\overset{H}{H}\!\!>\!C{=}C<\!\!\underset{H}{\overset{H}{}}} \longrightarrow \mathrm{H{-}\underset{Cl}{\overset{H}{\overset{|}{\underset{|}{C}}}}{-}\underset{Cl}{\overset{H}{\overset{|}{\underset{|}{C}}}}{-}H} \qquad \text{(Halogenation)}$$

$$\mathrm{H_2} + \mathrm{\overset{H}{H}\!\!>\!C{=}C<\!\!\underset{H}{\overset{H}{}}} \xrightarrow{\mathrm{Ni/Pt}} \mathrm{H{-}\underset{H}{\overset{H}{\overset{|}{\underset{|}{C}}}}{-}\underset{H}{\overset{H}{\overset{|}{\underset{|}{C}}}}{-}H} \qquad \text{(Hydrogenation)}$$

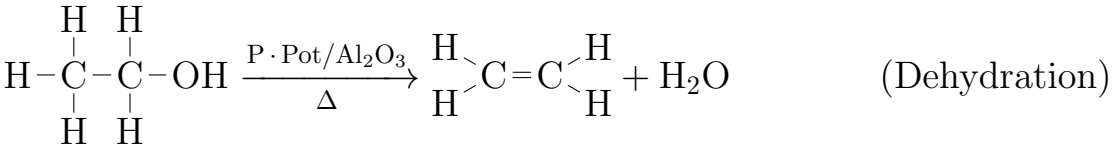
$$\mathrm{HCl} + \mathrm{\overset{H}{H}\!\!>\!C{=}C<\!\!\underset{H}{\overset{H}{}}} \longrightarrow \mathrm{H{-}\underset{H}{\overset{H}{\overset{|}{\underset{|}{C}}}}{-}\underset{Cl}{\overset{H}{\overset{|}{\underset{|}{C}}}}{-}H} \qquad \text{(HX Addition)}$$

$$\mathrm{n}\ \mathrm{\overset{H}{H}\!\!>\!C{=}C<\!\!\underset{H}{\overset{H}{}}} \xrightarrow{\mathrm{AP}} \mathrm{{-}(-C-C-)_{\mathit{n}}{-}} \qquad \text{(Polymerisation)}$$

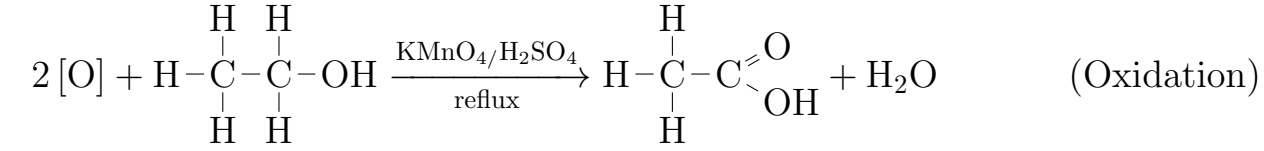
$$\mathrm{H_2O} + [\mathrm{O}] + \mathrm{\overset{H}{H}\!\!>\!C{=}C<\!\!\underset{H}{\overset{H}{}}} \xrightarrow{\mathrm{KMnO_4}} \mathrm{H{-}\underset{OH}{\overset{H}{\overset{|}{\underset{|}{C}}}}{-}\underset{OH}{\overset{H}{\overset{|}{\underset{|}{C}}}}{-}Cl} \qquad \text{(Diol)}$$



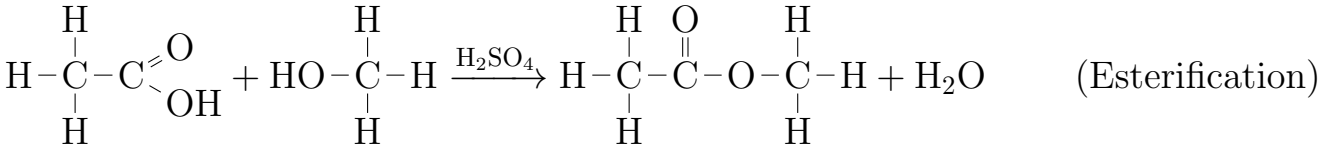
(Hydration)



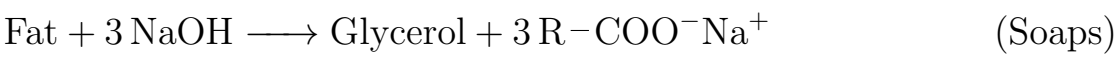
(Dehydration)



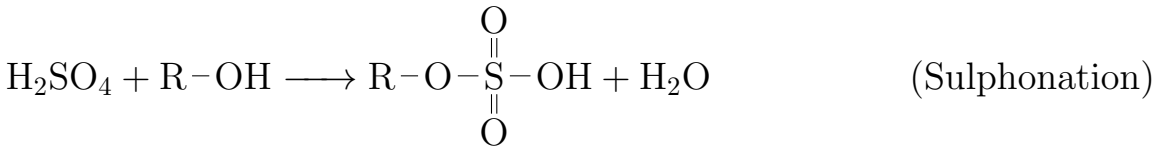
(Oxidation)



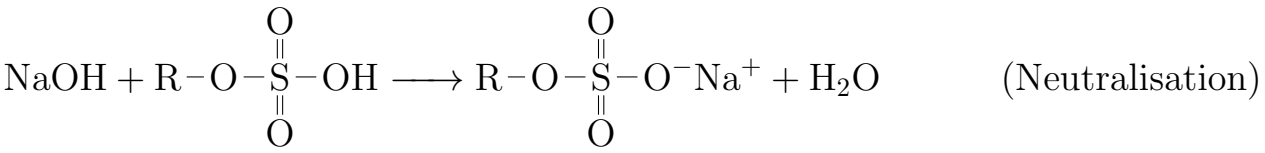
(Esterification)



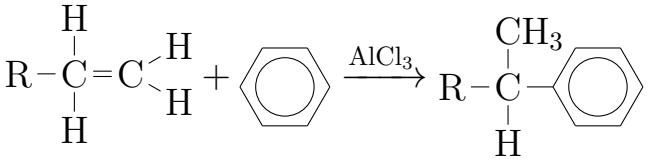
(Soaps)



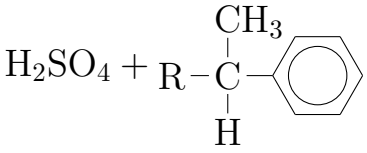
(Sulphonation)

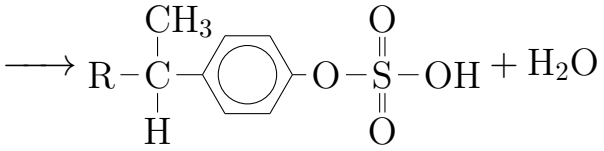


(Neutralisation)

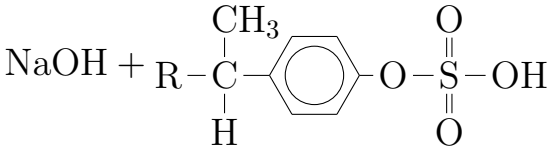


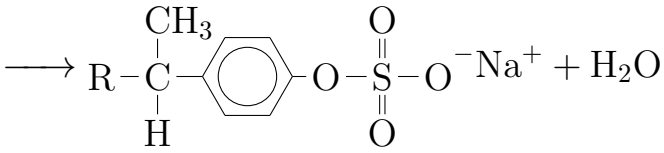
(Alkylation)





(Sulphonation)





(Neutralisation)