Q15:

Describe the oxidising action of potassium dichromate and write the ionic equations for its reaction with: (i) iodide (ii) iron(II) solution and (iii) H_2S

Answer:

 $K_{2}Cr_{2}O_{7}$ acts as a very strong oxidising agent in the acidic medium.

$$K_2Cr_2O_7 + 4H_2SO_4 \longrightarrow K_2SO_4 + Cr_2(SO_4)_3 + 4H_2O + 3[O]$$

 $K_2Cr_2O_7$ takes up electrons to get reduced and acts as an oxidising agent. The reaction of $K_2Cr_2O_7$ with other iodide, iron (II) solution, and H_2S are given below.

(i) $K_2Cr_2O_7$ oxidizes iodide to iodine.

$$\begin{array}{c} Cr_2O_7^{2-} + 14H^+ + 6e^- \longrightarrow 2Cr^{3+} + 7H_2O \\ \\ 2I^- \longrightarrow I_2 + 2e^-] \times 3 \\ \hline Cr_2O_7^{2-} + 6I^- + 14H^+ \longrightarrow 2Cr^{3+} + 3I_2 + 7H_2O \end{array}$$

(ii) $K_2Cr_2O_7$ oxidizes iron (II) solution to iron (III) solution i.e., ferrous ions to ferric ions.