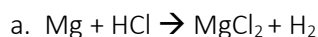
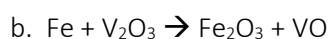


1. Consider the unbalanced equations of several redox reactions shown below. A redox reaction is composed of two different types reactions taking place simultaneously., the oxidation and the reduction reactions. For each redox reaction below identify the :

- atom oxidized,
- atom reduced,
- oxidizing agent (Oxidant),
- reducing agent (Reductant),
- oxidation half reaction,
- reduction half reaction,



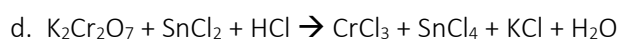
- atom oxidized = Mg from 0 to +2
 - atom reduced = H from +1 to 0
 - oxidizing agent = HCl metal
 - reducing agent = Mg metal
 - oxidation half reaction = $\text{Mg} \rightarrow \text{Mg}^{2+} + 2e$
 - reduction half reaction = $2\text{H}^+ + 2e \rightarrow \text{H}_2$
 - overall balanced equation = $\text{Mg} + 2\text{H}^+ \rightarrow \text{Mg}^{2+} + \text{H}_2$



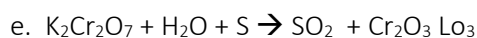
- atom oxidized = Fe from 0 to +3
 - atom reduced = V from +3 to +2
 - oxidizing agent = V_2O_3 metal
 - reducing agent = Fe
 - oxidation half reaction = $\text{Fe} \rightarrow \text{Fe}^{3+} + 3e$
 - reduction half reaction = $2e + 2\text{H}^+ + \text{V}_2\text{O}_3 \rightarrow 2\text{VO} + \text{H}_2\text{O}$



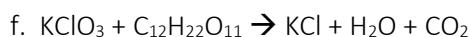
- atom oxidized = N from +3 to +5
 - atom reduced = Mn from +7 to +2
 - oxidizing agent = KMnO_4
 - reducing agent = KNO_2
 - oxidation half reaction = $\text{H}_2\text{O} + \text{KNO}_2 \rightarrow \text{KNO}_3 + 2\text{H}^+ + e$
 - reduction half reaction = $2e + 2\text{H}^+ + \text{V}_2\text{O}_3 \rightarrow 2\text{VO} + \text{H}_2\text{O}$



- atom oxidized = Sn from +2 to +4
 - atom reduced = Cr from +6 to +3
 - oxidizing agent = $\text{K}_2\text{Cr}_2\text{O}_7$
 - reducing agent = SnCl_2
 - oxidation half reaction = $\text{Sn}^{2+} \rightarrow \text{Sn}^{4+} + 2e$
 - reduction half reaction = $6e + 14\text{H}^+ + \text{Cr}_2\text{O}_7^{2-} \rightarrow 2\text{Cr}^{3+} + 7\text{H}_2\text{O}$



- atom oxidized = S from 0 to +4
 - atom reduced = Cr from +6 to +3
 - oxidizing agent = $\text{K}_2\text{Cr}_2\text{O}_7$
 - reducing agent = SnCl_2
 - oxidation half reaction = $\text{S} \rightarrow \text{S}^{2+} + 2e$
 - reduction half reaction = $6e + 8\text{H}^+ + \text{Cr}_2\text{O}_7^{2-} \rightarrow \text{Cr}_2\text{O}_3 + 4\text{H}_2\text{O}$



- atom oxidized = C from 0 to +4
 - atom reduced = Cl from +5 to -1
 - oxidizing agent = KClO_3
 - reducing agent = $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
 - oxidation half reaction = $6e + 6\text{H}^+ + \text{KClO}_3 \rightarrow \text{KCl} + 3\text{H}_2\text{O}$
 - reduction half reaction =
 $13\text{H}_2\text{O} + \text{C}_{12}\text{H}_{22}\text{O}_{11} \rightarrow 12\text{CO}_2 + 48\text{H}^+ + 48e$



- atom oxidized = C from +3 to +4
 - atom reduced = Mn from +6 to +3
 - oxidizing agent = K_2MnO_4
 - reducing agent = $\text{H}_2\text{C}_2\text{O}_4$
 - oxidation half reaction = $\text{H}_2\text{C}_2\text{O}_4 \rightarrow 2\text{CO}_2 + 2\text{H}^+ + 2e$
 - reduction half reaction =
 $10e + 10\text{H}^+ + 2\text{KMnO}_4 \rightarrow \text{Mn}_2\text{O}_3 + 5\text{H}_2\text{O}$