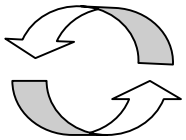
Redox 3

Half - Reactions



Write balanced half-equations for the following changes:

a. Magnesium metal being oxidised to magnesium ions

b. Chlorine being reduced to the Chloride ions

c. The cobalt ion undergoing a change of oxidation state from +3 to +2

d. Iodide ions being changed into iodine solid

e. Lead (II) oxide being reduced to lead metal

f. The oxidation of sulfur occurs as it changes from +4 to +6

g. Water being oxidised, producing oxygen and hydrogen ions

h. Hydrogen sulfide being oxidised to sulfur [clue in last one]

i. Water being reduced to hydrogen gas as well as producing hydroxide ions

j. Methanoic acid (HCOOH) being oxidised to carbon dioxide and hydrogen ions

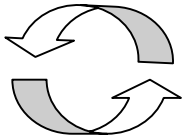
k. Carbon monoxide being further oxidised to carbon dioxide

l. Water undergoing a redox reaction to form oxygen and hydrogen ions

m. Acidified potassium permanganate being changed to manganese (II) plus, and another product (tricky)

Redox 3

Half – Reactions Answers



Write balanced half-equations for the following changes:

a. Magnesium metal being oxidised to magnesium ions

$Mg_{(s)} \rightarrow Mg^{2+}_{(aq)} + 2e^-$

b. Chlorine being reduced to the Chloride ions

$Cl_{2(g)} + 2e^- \rightarrow 2Cl^-$

c. The cobalt ion undergoing a change of oxidation state from +3 to + 2

$Co^{3+} + e^- \rightarrow Co^{2+}$

d. Iodide ions being changed into iodine solid

$2I^-_{(aq)} \rightarrow I_{2(g)} + 2e^-$

e. Lead (II) oxide being reduced to lead metal

$Pb^{2+} + 2e^- \rightarrow Pb_{(s)}$

f. The oxidation of sulfur occurs as it changes from +4 to +6

$S^{4+}_{(aq)} \rightarrow S^{6+}_{(aq)} + 2e^-$

g. Water being oxidised, producing oxygen and hydrogen ions

$H_2O \rightarrow \frac{1}{2}O_2 + 2H^+ + 2e^-$

h. Hydrogen sulfide being oxidised to sulfur [clue from last one]

$H_2S \rightarrow S + 2H^+ + 2e^-$

i. Water being reduced to hydrogen gas as well as producing hydroxide ions

$H_2O + e^- \rightarrow OH^- + \frac{1}{2}H_2$

j. Methanoic acid (HCOOH) being oxidised to carbon dioxide and hydrogen ions

$HCOOH \rightarrow CO_2 + 2H^+ + 2e^-$

k. Carbon monoxide being further oxidised to carbon dioxide

$SO_4^{2-} + 4H^+ + 2e^- \rightarrow SO_2 + 2H_2O$

l. Water undergoing a redox reaction to form oxygen and hydrogen ions

$2H_2O \rightarrow H_2O_2 + 2H^+ + 2e^-$

m. Acidified potassium permanganate being changed to manganese (II) plus, and another product (tricky)

$MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{2+} + 4H_2O$