Raffles Institution Raffles Programme
Year Four Chemistry

Name: _____ ( ) Class: _____ Date: _____

2022 FE Revision – Redox ANSWERS

Practice Questions

1 B 2 C 3 B

4 oxidation: $Mg \rightarrow Mg^{2+} + 2e^-$ reduction: $2H^+ + 2e^- \rightarrow H_2$

5 Cu^{2+} gains electrons to form Cu.
Hence, copper(II) ions, Cu^{2+}, are reduced to copper, Cu.

Zn loses electrons to form Zn^{2+} – this is oxidation
Hence, zinc, Zn, is oxidized to zinc ions, Zn^{2+}.

6 The oxidation state of nitrogen, N, increased from −3 in NH_3 to 0 in N_2.
Thus NH_3 is oxidised.

The oxidation state of copper, Cu, decreased from +2 in CuO to 0 in Cu.
Thus CuO is reduced.

7 The oxidation state of nitrogen, N, increased from +4 in NO_2 to +5 in HNO_3.
Thus NO_2 is oxidised.

The oxidation state of oxygen, O, decreased from 0 in O_2 to −2 in HNO_3.
Thus O_2 is reduced.

8 The oxidation state of chromium, Cr, decreased from +6 in $Cr_2O_7^{2-}$ to +3 in Cr^{3+}.
Thus $Cr_2O_7^{2-}$ is reduced.

The oxidation state of sulfur, S, increased from +4 in SO_3^{2-} to +6 in SO_4^{2-}.
Thus SO_3^{2-} is oxidised.

9 (a) amount of H_2O_2 reacted = 0.0470 x 0.0250 = 0.001175 mol

(b) amount of $KMnO_4$ reacted = 0.0200 x 0.0235 = 0.000470 mol

(c) x:y = 0.000470:0.001175 = 2:5

(d) The purple $KMnO_4$ solution becomes colourless.

(e) The oxidation state of oxygen, O, increased from −1 in H_2O_2 to 0 in O_2.
Thus H_2O_2 is oxidised, which means H_2O_2 is the reducing agent.

10 A is oxidation. CH_4 gained an oxygen to form CH_4O.

B is oxidation. CH_4O lost 2 hydrogen to form CH_2O.

C is oxidation. CH_2O gained an oxygen to form CH_2O_2.

D is oxidation. CH_2O_2 lost 2 hydrogen to form CO_2.