Chemguide - answers

REDOX DEFINITIONS

1. a)
$$Mg + H_2O \longrightarrow MgO + H_2$$

- (i) magnesium is being oxidised
- (ii) water is being reduced
- (iii) water is the oxidising agent
- (iv) magnesium is the reducing agent

If you didn't get this 100% right, stop now and go back and think this all out again. Redo the rest of the questions before you check any further.

b)
$$CuO + H_2$$
 — \blacktriangleright $Cu + H_2O$

- (i) hydrogen is being oxidised
- (ii) copper(II) oxide is being reduced
- (iii) copper(II) oxide is the oxidising agent
- (iv) hydrogen is the reducing agent

c)
$$Cu^{2+} + Zn$$
 \longrightarrow $Zn^{2+} + Cu$

- (i) zinc is being oxidised (loss of electrons OIL RIG)
- (ii) copper(II) ions are being reduced (gain of electrons)
- (iii) copper(II) ions are the oxidising agent
- (iv) zinc is the reducing agent

d) Mg + 2H⁺
$$\longrightarrow$$
 Mg²⁺ + H₂

- (i) magnesium is being oxidised
- (ii) hydrogen ions are being reduced
- (iii) hydrogen ions are the oxidising agent
- (iv) magnesium is the reducing agent

- (i) iron(II) ions are being oxidised
- (ii) chlorine is being reduced
- (iii) chlorine is the oxidising agent
- (iv) iron(II) ions are the reducing agent

f)
$$Cl_2 + 2l^2$$
 \longrightarrow $2Cl^2 + l_2$

- (i) iodide ions are being oxidised
- (ii) chlorine is being reduced
- (iii) chlorine is the oxidising agent
- (iv) iodide ions are the reducing agent

Chemguide - answers

2. a)
$$CH_3CONH_2 + 4[H]$$
 \longrightarrow $CH_3CH_2NH_2 + H_2O$

The CH₃CONH₂ has been reduced (loss of oxygen and gain of hydrogen)

b)
$$3CH_3CH_2OH + 2Cr_2O_7^{2-} + 16H^+$$
 \longrightarrow $3CH_3COOH + 4Cr^{3+} + 11H_2O$

The CH₃CH₂OH has been oxidised (gain of oxygen and loss of hydrogen)

c) O
$$4CH_3C$$
 + $NaBH_4$ + $3H_2O$ \longrightarrow $4CH_3CH_2OH$ + NaH_2BO_3

The ethanal (CH₃CHO) has been reduced (gain of hydrogen)