

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

- (a) the outer electron is in a higher (energy) level / there is an increase in shielding / the atoms get larger / more shells

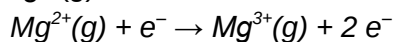
Mark independently

1

There is a weaker attraction between the nucleus and the outer electron.

1

- (b) $\text{Mg}^{2+}(\text{g}) \rightarrow \text{Mg}^{3+}(\text{g}) + \text{e}^{-}$



1

- (c) The electron is removed from 2p sub-shell / 2nd energy level / lower energy level / sub-shell that is closer to the nucleus

1

(Electron being removed is) less shielded (than 3s)

1

[5]

Q2.

- (a) Identity of gas: Carbon dioxide / CO_2 1

Test: When gas bubbled through limewater, a white ppt formed

When gas bubbled through limewater, it turns milky/cloudy

M2 dependent on M1

1

- (b) Effervescence (with Na_2CO_3), so contains H^+ ions / Effervescence (with Na_2CO_3), so is acidic

The result from Test 1 shows the presence of H^+ / acidic

1

White ppt (with AgNO_3), so contains chloride ions

The result from Test 2 shows the presence of chloride ions.

1

Allow balanced equation for each test that links to each observation

- (c) (Warm with some) NaOH , 1

Damp red litmus at the mouth of the tube turns blue

Do not allow red litmus dipped in solution

1

Add (acidified) BaCl_2 / $\text{Ba}(\text{NO}_3)_2$

If reagent incorrect, cannot score observation mark

1

White ppt formed

If reagent incomplete, mark on

1

Use of $\text{Ba}(\text{OH})_2$ can score M1 and M3

- (d) The second mass is smaller / the mass after step 4 is smaller than the mass after step 2 1

AgCl dissolves in dilute ammonia / some ppt dissolves as AgCl is soluble in dilute ammonia

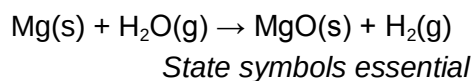
The ppt formed by chloride ions dissolves in dilute ammonia.

1

[10]

Q3.

- (a) Bright light / white light / white powder/ash/solid 1



1

- (b) M1: Attraction between (lattice of) Mg^{2+} ions
M1 attraction between nucleus and delocalised electrons or between + ions and delocalised electrons

1

M2: And delocalised electrons
M2 outer shell electrons delocalised

1

- (c) (Giant) ionic lattice / lots of Mg^{2+} and Cl^- ions 1

Strong (electrostatic) forces of attraction 1

Between Mg^{2+} and Cl^- ions
Allow oppositely charged ions 1

- (d) Indigestion relief / laxative / neutralise (excess stomach) acid
Allow milk of magnesia 1

[8]