Practice Question Set For A-Level
Subject : Chemistry
Paper-1 Topic: Inorganic 1

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 16 Marks **Time : 16 Minutes**

Mark Schemes

Q1.

(a) Sulfuric acid has 2 × the H^+ ion concentration

Larger concentration of H^+ is sufficient.

1

Calcium is more reactive (than magnesium)

Allow reference to a greater surface area for calcium.
Do not allow any references to temperature variations.

1

(b) Calcium sulfate

Accept $CaSO_4$

1

$Ca + H_2SO_4 \rightarrow CaSO_4 + H_2$

Accept $Ca^{2+} + SO_4^{2-} \rightarrow CaSO_4$
Allow multiples or fractions of these equations.
Ignore state symbols.

1

Calcium sulfate is <u>insoluble</u> or has <u>(very) low solubility</u>

Accept "an <u>insoluble</u> layer is formed".
Answer must refer to the low solubility.

1

[5]

Downloaded from www.merit-minds.com

Q2.

Identifies precipitate as being $BaSO_4$

1

Moles of Barium sulfate = mass/Mr
(= 0.764 / 233.4)
= 0.003273 moles

Allow conseq if Mr $BaSO_4$ or $BaCl_2$ incorrect

1

Mass of Barium chloride = 208.3 × 0.003273 = 0.6818 g

1

Percentage of Magnesium chloride $= \frac{1.056 - 0.6818}{1.056} \times 100$

Do NOT penalise incorrect precision here

Allow range 33.7-35.5% (rounding errors penalised elsewhere in paper)

1

[4]

Downloaded from www.merit-minds.com

Q3.

(a) More (electron) shells / (outer) electrons further from the nucleus / larger atoms / more shielding

If 'molecules' mentioned CE = 0

It = Ba

Mark independently

***ALLOW** energy levels for shells*

Both ideas must be comparative

1

So weaker <u>attraction</u> of nucleus/protons for (outer) electrons

***NOT** hold/pull/bonded for 'attraction'*

Idea of nucleus or protons must be clear

***ALLOW** M2 if electrons implied from mention in M1*

***ALLOW** converse if it is clear that answer refers to Ca*

1

(b) <u>White</u> solid / <u>white</u> ash

***ALLOW** 'white smoke/powder'*

***IGNORE** 'product'*

***NOT** ppt*

***IGNORE** fumes*

***IGNORE** tube/glass goes black*

1

Bright light / white light

***ALLOW** glow/flame for light*

1

$Mg + H_2O \longrightarrow MgO + H_2$

***IGNORE** state symbols*

1

(c) $BaSO_4$ is insoluble but $Ba(NO_3)_2$ is soluble

OR

$BaSO_4$ precipitates but $Ba(NO_3)_2$ product(s) of second reaction is soluble/remains in solution

OR

$BaSO_4$ is insoluble but no reaction occurs in second case

***NOT** just 'no observation' in second case*

<u>Comparison</u> of solubilities must be implied

***NOT** Barium is soluble/insoluble*

Correct state symbols required

1

$Ba^{2+}(aq) + SO_4^{2-}(aq) \longrightarrow BaSO_4(s)$

1

[7]

Downloaded from www.merit-minds.com