

ACTIVITY 6 – sample student work

Chemistry

Paper 1C, Q3(a) – (c)

3 A student does these two tests on a solution made from a white solid.

- flame test
- add acidified silver nitrate solution

The table shows his results.

Test	Result
flame test	red flame
add acidified silver nitrate solution	cream precipitate

(a) Give the formula of the ion that produces the red flame.

(1)

(b) Name the cream precipitate.

(1)

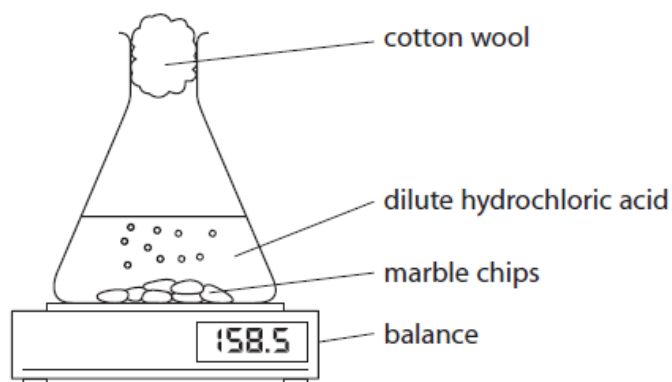
(c) Identify the white solid.

(1)

Question number	Answer	Notes	Marks
3 a	Li^+	ALLOW Sr^{2+}	1
b	silver bromide / AgBr	If correct name given ignore incorrect formula	1
c	lithium bromide / LiBr	Mark CSQ on (a) and (b) If both name and formula given both must be correct	1

Paper 1CR, Q5(a)(i)

- 5 A student uses this apparatus to investigate the rate of reaction between marble chips and dilute hydrochloric acid.

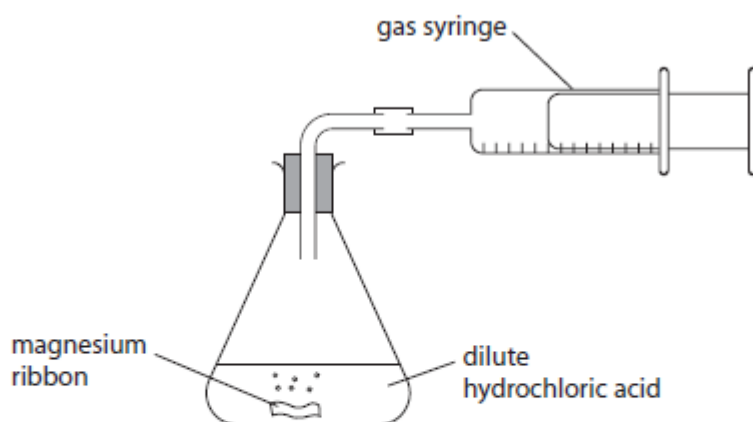


- (a) During the reaction, the reading on the balance decreases because mass is lost from the flask.
- (i) Explain how using the cotton wool increases the accuracy of this investigation. (2)

5	a (i)	<p>An explanation linking the following two points</p> <p>M1 to stop acid (spray) leaving the flask OWTTE</p> <p>M2 as (without cotton wool) mass loss would be too large OWTTE</p>	<p>ALLOW so that only gas can escape (from flask) OWTTE</p> <p>ALLOW so the only cause of mass loss is gas (escaping)</p> <p>REJECT stops gas escaping</p> <p>REJECT references to substances/impurities/gases entering flask</p> <p>ALLOW as with cotton wool the mass does not decrease by more than it should OWTTE</p>	2
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Paper 1C, Q13(d) – (e)

- 13 A student uses this apparatus to investigate the rate of reaction between magnesium and an **excess** of dilute hydrochloric acid.



She uses this method.

- use a graduated beaker to pour 50 cm^3 of dilute hydrochloric acid of concentration 2.00 mol/dm^3 into the conical flask
- add a piece of magnesium ribbon of mass 0.086 g to the acid and put the bung into the neck of the flask
- measure the total volume of gas collected every ten seconds until the reaction stops

- (d) The student uses a graduated beaker to measure the volume of dilute hydrochloric acid.

Explain why it is **not** necessary to use a measuring cylinder in this experiment.

(2)

- (e) The ionic equation for the reaction between magnesium and hydrochloric acid is



Use the information in this equation, and the particle collision theory, to explain why the rate of reaction decreases during each of the experiments.

(3)

Question number	Answer	Notes	Marks
13 d	<p>An explanation that links together the following two points:</p> <p>M1 the acid is in excess</p> <p>M2 therefore a precise/ an accurate measurement of the volume is not required</p>	<p>M2 dep on M1</p>	2
13 e	<p>An explanation that links the following points:</p> <p>M1 the concentration of the acid/hydrogen ions/H^+ (ions) decreases</p> <p>M2 therefore there are fewer (successful) collisions (between the hydrogen ions/H^+ ions and the magnesium atoms)</p> <p>M3 per second/per unit time</p>	<p>ALLOW there are fewer hydrogen ions/H^+ (ions) in the same volume</p> <p>ALLOW the surface area of the magnesium decreases</p> <p>less frequent collisions/ slower collision rate scores M2 and M3</p> <p>M3 dep on M2</p> <p>IGNORE less chance of collision</p> <p>MAX 1 if reference to energy of particles changing</p>	3

Paper 1CR, Q9(a)

- 9 (a) Diamond is a naturally-occurring form of carbon.

It has a giant molecular structure.

Explain, with reference to its structure and bonding, why diamond has a high melting point.

(3)

Question number	Answer	Notes	Marks
9 (a)	<p>An explanation linking the following three points</p> <p>M1 covalent bonds are strong</p> <p>M2 many (covalent) bonds (need to be broken)</p> <p>M3 a large amount of (thermal/heat) energy is needed to break the bonds</p>	<p>ACCEPT strong (electrostatic) forces of attraction between the nuclei of atoms and the bonding electrons</p> <p>IGNORE more energy</p> <p>NOT just heat</p> <p>Any mention of intermolecular forces/forces between molecules or ions/ionic bonding /metallic bonding scores 0 out of 3</p>	3