

ACTIVITY 6 – sample student work

Chemistry

Paper 1C, Q3(a) – (c)

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

(1)

Lithium

(b) Name the cream precipitate.

(1)

Bromine

(c) Identify the white solid.

(1)

Lithium Bromide

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

(1)

Ca²⁺

(b) Name the cream precipitate.

(1)

Bromine

Bromine

(c) Identify the white solid.

(1)

Calcium bromide

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

(1)

~~Lithium~~ Li⁺

(b) Name the cream precipitate.

(1)

Bromide Silver bromide

(c) Identify the white solid.

(1)

Lithium bromide

Paper 1CR, Q5(a)(i)

(i) Explain how using the cotton wool increases the accuracy of this investigation.

(2)

The cotton wool prevents the gas coming out from the flask and ~~prevent~~ air coming into the flask.

(2)

The cotton wool allows carbon dioxide to escape, ~~reducing~~ ~~giving~~ resulting in a more accurate mass reading.

(i) Explain how using the cotton wool increases the accuracy of this investigation.

(2)

prevents acid splashing out which could decrease the mass.

Paper 1C, Q13(d) - (e)

The dilute hydrochloric acid needs to be in excess as the experiment is measuring the volume of hydrogen produced from a specific mass of magnesium.

A graduated beaker tells you where 50cm^3 is, 100cm^3 , 200cm^3 etc, so a measuring cylinder is not necessary for this experiment.

The hydrochloric acid was ^{present}~~used~~ in excess and so accuracy of measurement (as would be provided with a measuring cylinder) is not so important. ~~At~~ An excess of hydrochloric acid is important, which does not require precision.

As the reaction progresses Mg forms Mg^{2+} and H_2 . As the reaction continues there are less Mg and H^+ in the same volume of solution as particles have already reacted to form Mg^{2+} and H_2 . Therefore as there are less particles there is a reduced collision frequency and so reduced number of successful collisions per second hence the rate of reaction decreases.

As soon as the magnesium is added to the dilute hydrochloric acid, it begins to react very quickly because all of the surface area is available to be reacted. Over time, the reaction begins to slow down because the surface area is decreasing and hence there are less magnesium particles to react with, hence the reaction slows down.

The rate of reaction decreases during the reaction, because as the reaction is going the reactants are being used up, this means that there are less particles to collide with, this means that the collision frequency decreases, which means that there are less successful collisions, so the reaction happens much slower. There are less successful collisions as there are less particles with enough energy.

(Total for Question 13 = 12 marks)

Paper 1CR, Q9(a)

Has strong carbon to carbon covalent bonds.

Strong intermolecular forces of attraction between molecules and bonds which are difficult to break thus resulting in a high melting point.

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

(3)

Carbon atoms are

It is tetrahedrally arranged, and each carbon atom is bonded

to 4 others, which means there are many strong covalent bonds

In diamond. When melting, a lot of energy is required to

break these strong covalent bonds between carbon atoms, so

it has a high melting point.

Since diamond has many covalent bonds which are linked to

every carbon atom. Their structure is ~~big~~ giant so it requires more energy to break their bonds.