

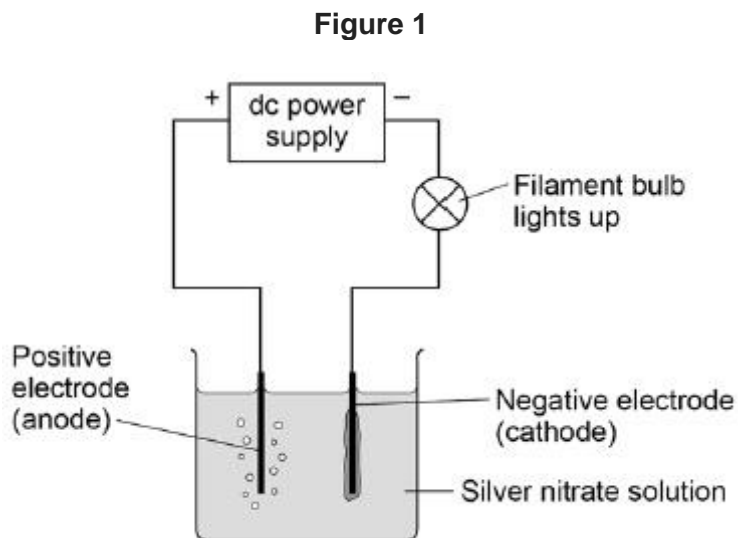
Chemistry unit 4 homework – Chemical changes

For each of the questions below: -

Highlight the command word if there is one & annotate what the command word means. - Answer the question!

Q1. An electric current is passed through silver nitrate solution.

Figure 1 shows the apparatus.



The solution contains four ions:

- Ag^+
- H^+
- NO_3^-
- OH^-

(c) Where do the H^+ and OH^- ions come from?

Tick **one** box.

Air

Electrodes

Silver nitrate

Water

(1)

(d) Ag^+ ions and H^+ ions are attracted to the negative electrode (cathode).

Give a reason why.

(1)

(e) Silver is produced at the negative electrode (cathode) and not hydrogen.

What does this tell you about the reactivity of silver?

Chemistry unit 4 homework – Chemical changes

For each of the questions below: -

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Tick **one** box.

Silver is less reactive than hydrogen

Silver is less reactive than oxygen

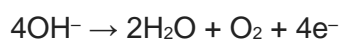
Silver is more reactive than nitrate

Silver is more reactive than water

(1)

- (f) The hydroxide ion (OH^-) is attracted to the positive electrode (anode).

The equation shows what happens at the positive electrode (anode).

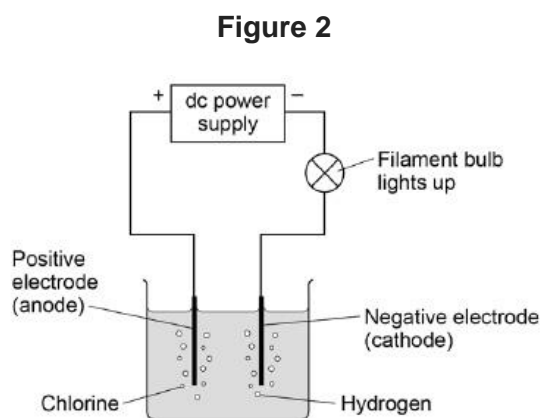


Name the gas produced at the positive electrode (anode).

(1)

- (g) An electric current is passed through sodium chloride solution.

Figure 2 shows the apparatus.



After passing an electric current through sodium chloride solution one product is sodium hydroxide (NaOH) solution.

The presence of sodium hydroxide can be shown by adding an indicator.

Name an indicator.

Give the colour of the indicator in sodium hydroxide solution.

Indicator _____

Colour _____

(2)

(Total 8 marks)

Chemistry unit 4 homework – Chemical changes

For each of the questions below: -

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Q2 This question is about making copper salts.

Outline a safe plan the student could use to make pure, dry, crystals of the soluble salt copper sulfate from the insoluble metal oxide and dilute acid.

(Total 6 marks)

Q3 This question is about metal oxides.

When sodium is heated in oxygen, sodium oxide is produced.

(a) Balance the equation for the reaction.



(1)

(b) Why is this an oxidation reaction?

(1)

(c) Sodium oxide is added to water and shaken.

Universal indicator is added.

The pH of the solution is 14

What is the colour of the universal indicator?

(1)

(d) Aluminium oxide reacts with hydrochloric acid to produce a salt.

What is the name of the salt produced?

(1)

Chemistry unit 4 homework – Chemical changes

For each of the questions below: -

Highlight the command word if there is one & annotate what the command word means. - Answer the question!

Q4 student investigated the reactivity of three different metals.

This is the method used.

1. Place 1 g of metal powder in a test tube.
2. Add 10 cm³ of metal sulfate.
3. Wait 1 minute and observe.
4. Repeat using the other metals and metal sulfates.

The student placed a tick in the table below if there was a reaction and a cross if there was no reaction.

	Zinc	Copper	Magnesium
Copper sulfate	✓	x	✓
Magnesium sulfate	x	x	x
Zinc sulfate	x	x	✓

(a) What is the dependent variable in the investigation?

_____ (1)

(b) Use the results shown in table above to place zinc, copper and magnesium in order of reactivity.

Most reactive _____



Least reactive _____

(1)

(c) Suggest **one** reason why the student should **not** use sodium in this investigation.

(1)

(d) Name the element used to reduce iron oxide when carbon dioxide is produce.

(1)

(e) In terms of oxygen what is meant by reduction?

(1)