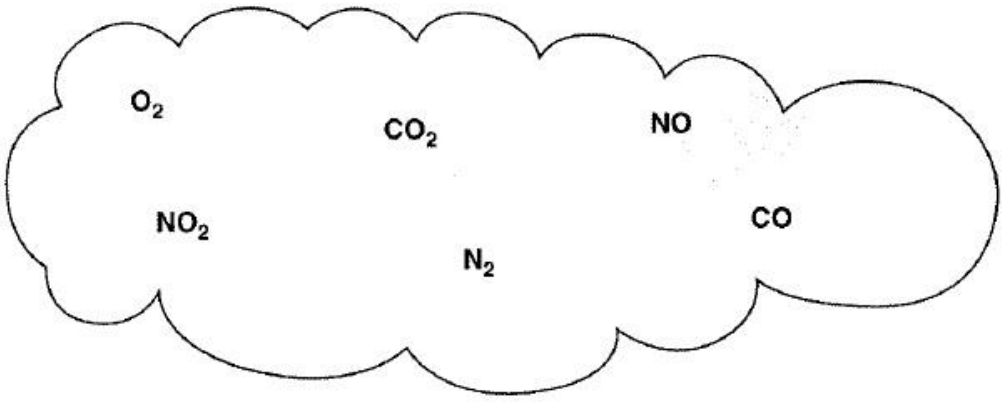
2011 O level P2

1 (2011/O/GCSE/P2/01) air The diagram shows the formulae of some gases found in polluted air.



Choose formulae from the diagram to answer the following questions (a) to (d)

(a) Give the formula of a gas that is produced by incomplete combustion of fuels.

_____ and _____ [1]

(b) Give the formulae of two gases that are produced by reactions in catalytic converters.

_____ and _____ [1]

(c) Give the formulae of two gases that are involved in both respiration and photosynthesis.

_____ and _____ [1]

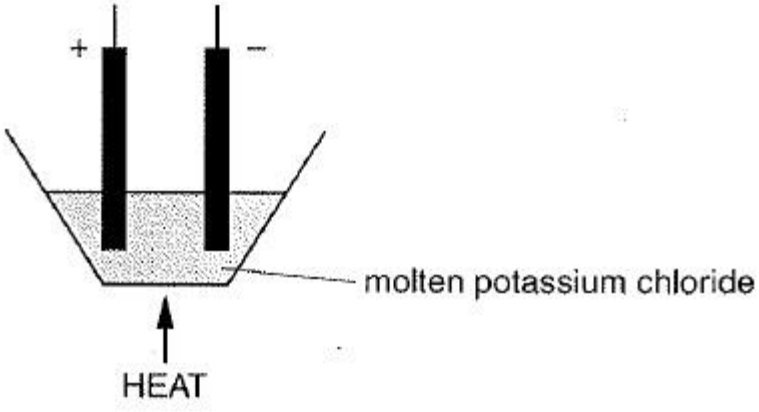
(d) Give the formulae of two gases that each contain an element with an oxidation state of +2.

_____ and _____ [1]

2 (2011/O/GCSE/P2/02) electrolysis Read the information about the electrolysis of potassium chloride.

Potassium chloride has a melting point of over 700°C

Molten potassium chloride can be electrolyzed



Chloride gas forms at the anode. We might expect potassium metal to form at the cathode, but practice potassium is very soluble in molten potassium chloride. A solution of potassium in molten potassium chloride forms. This problem means that electrolysis cannot be used to extract potassium from potassium chloride.

(a) The information contains an example of a compound and an example of a mixture.

(i) Identify the compound and mixture in the information.

[1]

(ii) Explain the difference between a compound and a mixture.

[1]

(b) The electronic configuration of a potassium atom can be written 2.8.8.1. Complete the table to show the electronic configuration of a potassium ion and a chloride ion.

Ion	**Electronic configuration**
K^+	
C/---	

(c) **(i)** Write the ionic half equation for the reaction that happens at the anode.

[1]

(ii) Describe a simple test that would confirm the identity of the element formed at the anode. Include the result of the test in your answer.

[2]

(d) Dilute aqueous potassium chloride can also be electrolyzed. Describe two differences between the products of the electrolysis of dilute aqueous potassium chloride and the products of the electrolysis of molten potassium chloride.

[2]

3 (2011/O/GCSE/P2/03) rates Two experiments were carried out to measure the rate of reaction between excess powdered calcium carbonate and dilute hydrochloric acid. The reaction produces a gas. The rate of reaction was followed by measuring the volume of gas produced at regular time intervals.

(a) In experiment 1, 20 cm^3 of 0.1 mol/dm^3 hydrochloric acid was used. Give the name and formula of the salt that forms in the reaction.

Name _____

Formula _____ [2]