

3 This question is about electrolysis.

(a) Complete the definition of electrolysis by filling in the missing words.

The decomposition of ..... compounds when .....  
or ..... by the passage of an electric current.

[3]

(b) Electrolysis of aqueous copper(II) sulfate is carried out using the apparatus shown in Fig. 3.1. The electrodes are made of platinum.

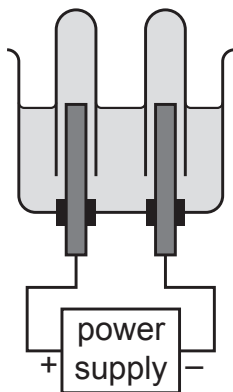


Fig. 3.1

(i) State whether the mass of the cathode increases, decreases or remains the same when platinum electrodes are used.

..... [1]

(ii) Describe the change in appearance, if any, of the electrolyte when platinum electrodes are used.

..... [1]

(iii) Describe what is seen at the anode when platinum electrodes are used.

..... [1]

(iv) Write the ionic half-equation for the reaction at the anode.

..... [3]

(c) The electrolysis is repeated using copper electrodes.

(i) State whether the mass of the cathode increases, decreases or remains the same when copper electrodes are used.

..... [1]

(ii) Describe the change in appearance, if any, of the electrolyte when copper electrodes are used.

..... [1]

(d) Aluminium is extracted from its purified ore by electrolysis.

(i) Name this ore of aluminium.

..... [1]

(ii) Name the substance added to this process to reduce the operating temperature.

..... [1]

(iii) Explain why the anodes need to be continually replaced during this process.

.....

..... [2]

[Total: 15]