4 Electroplating and fuel cells – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	Write it 3 times (English)		
fuel cell			
Electroplating			
corrosion			

Recall

From Part 1 you know electrolysis splits a compound at two electrodes. Here we use it to **coat metals** (electroplating) and meet the **fuel cell** .

- Electroplating puts a thin metal layer on an object.
- A fuel cell makes electricity from hydrogen and oxygen.

Nothing here is hard – it just applies the idea.

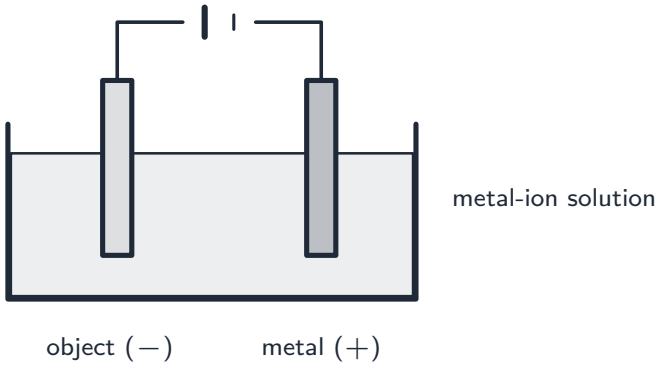
New ideas

Read these first, then do the Practice.

■ 1 Electroplating

Electroplating covers a metal object with a thin layer of another metal (to look better and resist **corrosion**). To electroplate:

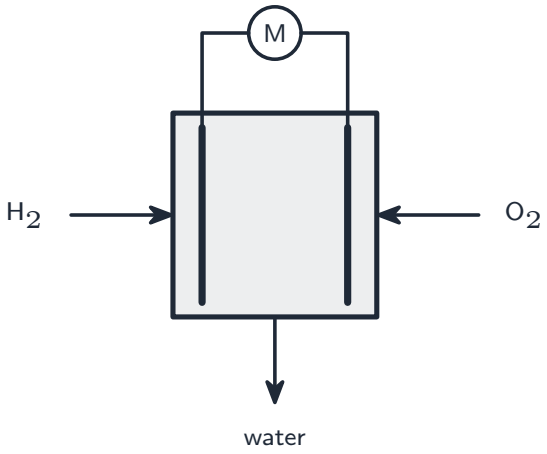
- make the **object** the **cathode** (−).
- make the **plating metal** the **anode** (+).
- use an electrolyte containing **ions of the plating metal**.



2 The hydrogen–oxygen fuel cell

A **fuel cell** makes electricity directly from hydrogen and oxygen. The **only product is water**:

$$2H_2 + O_2 \rightarrow 2H_2O$$



- **advantage** – the only product is water, so it does not pollute the air.
- **disadvantage** – hydrogen is hard and dangerous to store, and making it can still use fossil fuels.

Watch out: when electroplating, the **object** to be coated is the **cathode** (−) and the **plating metal** is the **anode** (+); the electrolyte must contain **ions of the plating metal**. A fuel cell's only product is water.

Practice

Try these in order.

4.1 What is *electroplating*, and why is it done? [2]

4.2 When electroplating, which electrode is (a) the object, (b) the plating metal? [2]

4.3 Write the overall equation for the hydrogen–oxygen fuel cell. [1]

4.4 What is the only chemical product of a hydrogen–oxygen fuel cell? [1]

4.5 State one advantage and one disadvantage of a fuel cell compared with a petrol engine. [2]

4.6 Challenge. A steel spoon is to be electroplated with silver. State (a) which electrode the spoon should be, and (b) a suitable electrolyte. [2]