

# Energy Changes

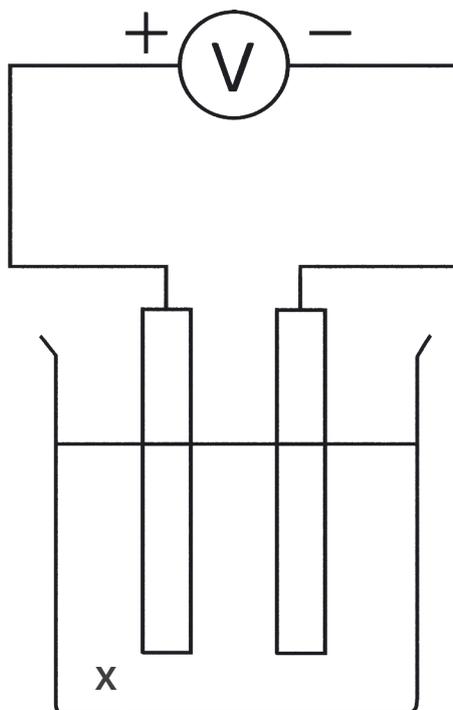
## Multiple Choice Questions

### Set 4 (Chemistry Only)

Tick **one** box.

1. **Figure 1** shows a chemical cell.

**Figure 1**



What is the part of the chemical cell labelled X?

- A. electrode
- B. electrolyte
- C. electrolysis
- D. voltmeter


2. Which factor below does **not** affect the voltage produced by a chemical cell?

- A. the concentration of the electrolyte
- B. the size of the electrodes
- C. the type of electrodes
- D. the type of electrolyte



A group of students carried out an investigation into chemical cells. They built four cells. Each cell had a copper electrode. The second electrode in each cell was made of a different metal.

**Table 1** shows their results.

**Table 1**

Electrode 1	Electrode 2	Voltage of the Cell (V)
copper	metal A	0.00
copper	metal B	1.10
copper	metal C	0.78
copper	metal D	2.71

3. Which metal in **Table 1** is most likely to be copper?

- A. metal A
- B. metal B
- C. metal C
- D. metal D

4. Which metal in **Table 1** is the most reactive compared to copper?

- A. metal A
- B. metal B
- C. metal C
- D. metal D

5. Which of the objects below is most likely to use alkaline batteries?

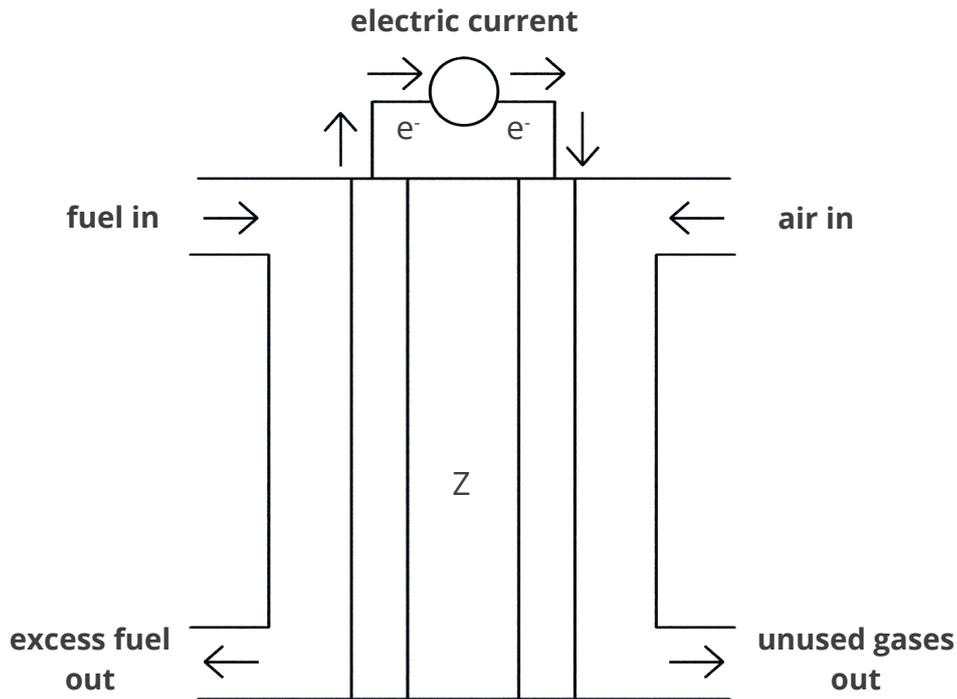
- A. electric car
- B. handheld torch
- C. laptop computer
- D. mobile phone



6. Which of the following is **not** an advantage of using hydrogen fuel cells in cars?
- A. a large amount of energy can be transferred from a small amount of hydrogen fuel
  - B. hydrogen fuel cells have a longer life span than rechargeable batteries
  - C. producing hydrogen fuel involves the extraction of fossil fuels
  - D. the only waste product is water
7. A chemical cell is made using an iron electrode and a zinc electrode. Zinc is more reactive than iron. The voltage of the cell is 0.32V. What would happen to the voltage of the cell if the iron electrode is replaced with a less reactive metal such as silver?
- A. it is not possible to predict what will happen to the voltage of the cell
  - B. the voltage would decrease
  - C. the voltage would increase
  - D. the voltage would stay the same
8. Which of the following statements is correct?
- A. a 1.5V battery can be made by connecting three 0.5V cells together
  - B. a 1.5V battery cannot be recharged
  - C. a 1.5V cell can be made by connecting three 0.5V batteries together
  - D. a 1.5V cell contains an electrolyte with a high concentration

9. **Figure 2** shows a hydrogen fuel cell.

**Figure 2**



Which of the following best describes the role of the part labelled **Z** in **Figure 2**?

- A. fuel
- B. electrode
- C. electrolyte
- D. waste product

10. Which equation correctly shows the oxidation of hydrogen which occurs at the anode (negative electrode) in a hydrogen fuel cell? (**HT only**)

- A.  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- B.  $\text{H}_2 \rightarrow 2\text{H}^+ + 2\text{e}^-$
- C.  $4\text{H}^+ + \text{O}_2 + 4\text{e}^- \rightarrow 2\text{H}_2\text{O}$
- D.  $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$