

## Metal Extraction

### Q1. (2018) – 3b, 3c, 3d

- 3 Most metals are extracted from ores found in the Earth's crust.

The method used to extract a metal from its ore is linked to the reactivity of the metal.

Part of the reactivity series is shown in Figure 2.

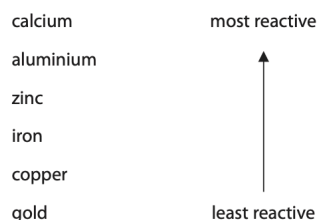


Figure 2

A)

- (b) Aluminium cannot be extracted by heating its oxide with carbon.  
Aluminium has to be extracted from its oxide by electrolysis.

Explain why.

(2)

B)

- (c) Predict the method that will have to be used to extract calcium from its ore.

(1)

C)

- (d) In recent years, researchers have been investigating alternative methods of extracting metals from soils.

Researchers have found that growing certain plants in appropriate areas can result in the phytoextraction of copper.

Describe how growing plants can result in the phytoextraction of copper.

(2)

### Q2. (2019) – 5a (ii)

- 5 (a) One way to extract metals from land contaminated with metal compounds is phytoextraction.  
When plants grow they absorb metal ions through their roots.  
The plants are harvested, dried and burned forming an ash.  
The ash contains metal compounds.

Plants were grown in a piece of ground contaminated with nickel compounds.

- (ii) Nickel is extracted from nickel compounds.

State an advantage of extracting nickel by phytoextraction rather than from its ore.

(1)

### Q3. (2019) – 5b (ii)

- (b) Some nickel ores contain nickel sulfide.

- (ii) In the final stage of the extraction process, a nickel compound is electrolysed to produce pure nickel.

An advantage of producing a metal by electrolysis is that

(1)

- ☐ A electrolysis uses a large amount of electricity  
☐ B the metal produced by electrolysis is very pure  
☐ C electrolysis is a very cheap method of extraction  
☐ D electrolysis is the only method of extracting unreactive metals

Q4. (2021) – 7b

- (b) Metals can be extracted from ores found in the Earth's crust.

Explain why aluminium cannot be extracted from its ore by heating with carbon but can be extracted by electrolysis.

(2)

Q5. (2022)

- 6 The method used to extract a metal from its ore depends on the position of the metal in the reactivity series.

- (a) Aluminium is extracted from its ore by electrolysis.

Explain why this method is used to extract aluminium from its ore.

(2)

Q6. (2022) – 6c, 6d

- 6 The method used to extract a metal from its ore depends on the position of the metal in the reactivity series.

A)

- (c) Phytoextraction is an alternative biological method that can be used to extract metals from very low-grade ores.

Give **one** disadvantage of phytoextraction as a method of extraction of metals.

(1)

B)

- (d) Copper is low down in the reactivity series and can be obtained from copper oxide.

Devise a simple method to obtain a sample of copper from copper oxide in the laboratory.

(2)

Q7. (2024) – 5c

- (c) One of the alternative biological methods of extracting metals from very low-grade ores is bioleaching using bacteria.

Give one **disadvantage** of this method of extracting metals from low-grade ores.

(1)

Q8. (2024) – 5d

- (d) Lead is low in the reactivity series.

Describe how to obtain a sample of lead from some lead oxide in the laboratory.

(2)