Extracting Metals

KS3 Chemistry · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

What is an ore?

Step 1 · Definition

A rock that contains enough of a metal (usually compound) to make it worth extracting.

Step 2 · Example

Haematite is an iron ore containing iron oxide.

Answer: A rock containing enough metal compound to extract profitably

Check: Whether it is 'worth it' depends on the metal's price.

2. Now try one with the steps

Write the word equation for extracting copper from copper oxide with carbon.

Step 1 · Carbon is more reactive than copper

Step 2 · Products

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What is an ore? [1]

2. Name a metal found pure element in the ground. [1]

3. Which element is used to extract iron from iron oxide? [1]

4. What gas is made when carbon reduces a metal oxide? [1]

5. What does 'reduction' mean here? [1]

6. Complete: iron oxide + carbon → _____ + _____ [2]

7. Can carbon extract magnesium from magnesium oxide? Explain. [2]

8. Which method is used for metals above carbon, such? [1]

9. In iron oxide + carbon → iron + carbon dioxide, which substance is oxidised? [1]

10. Which substance is reduced in that reaction? [1]

11. Why were copper and iron used thousands of years before aluminium? [2]

12. 8.0 g of copper oxide gives 6.4 g of copper. What mass of oxygen was removed, in g? [1]

13. Give TWO environmental problems caused by mining and extracting metals. [2]

14. Suggest why the most common method of extracting a metal depends on its position in the reactivity series. [3]

4. Before you hand it in

"Carbon can extract any metal."
Check the reactivity series: carbon reduces zinc, iron, tin, lead and copper oxides.

Mixing up oxidation and reduction.
The substance gaining oxygen is oxidised; the one losing oxygen is reduced.

"Ores are pure metal."
Only very unreactive metals are found native.

Forgetting carbon dioxide product.
metal oxide + carbon → metal + carbon dioxide.