

Alloys Ceramics Composites

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Compare the properties and uses of high carbon steel and low carbon steel. (3 marks)

Step 1 · High carbon

Strong but brittle; used for tools and blades.

Step 2 · Low carbon

Softer and more easily shaped; used for car bodies and wire.

Step 3 · Comparison

More carbon makes steel harder and stronger but more brittle.

Answer: High carbon: strong, brittle; low carbon: soft, easily shaped

Check: Stainless steel contains chromium and nickel and resists corrosion.

2. Now try one with the steps

Explain the difference between thermosoftening and thermosetting polymers. (3 marks)

Step 1 · Thermosoftening

Step 2 · Thermosetting

Step 3 · Use

Answer:

3. Practice

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

1. Name the two metals in bronze. [1]

2. Name the two metals in brass. [1]

3. Compare the properties of high carbon steel and low carbon steel. [2]

4. Name two elements added to iron to make stainless steel and give one property. [2]
- _____
- _____
5. Explain why aluminium alloys are used to build aircraft. [1]
- _____
- _____
6. Name the raw materials used to make soda-lime glass. [2]
- _____
- _____
7. Give one advantage of borosilicate glass over soda-lime glass. [1]
- _____
- _____
8. Describe how clay ceramics such and pottery are made. [2]
- _____
- _____
9. Explain how low density and high density poly(ethene) are made with different properties. [2]
- _____
- _____
10. Explain why thermosetting polymers do not melt when heated. [2]
- _____
- _____
11. Describe the structure of a composite material and give one example. [2]
- _____
- _____
12. Bronze is 88% copper and the rest tin. Calculate the mass of tin, in g, in 500 g of bronze. [2]
- _____
- _____
13. A brass is 63% copper and the rest zinc. Calculate the mass of zinc, in g, in 200 g of this brass. [2]
- _____
- _____
14. A 4.5 kg steel part is replaced by a 1.5 kg composite part. Calculate the percentage reduction in mass to the nearest whole number. [2]
- _____
- _____

4. Before you hand it in

"Thermosetting polymers can be melted and reshaped."

Thermosoftening polymers melt; thermosetting polymers do not.

"A composite is an alloy of non-metals."

Reinforcement + matrix, each keeping its own properties.

Confusing bronze and brass

Bronze = copper + tin; brass = copper + zinc.