

Transition Metals

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

Name _____ Class _____ Date _____

1. Worked example

Compare the properties of iron with those of sodium. (4 marks)

Step 1 · Melting point

Iron has a much higher melting point (1538 °C compared with 98 °C).

Step 2 · Density

Iron is much denser (7.9 g/cm³ compared with 0.97 g/cm³).

Step 3 · Strength and hardness

Iron is stronger and harder; sodium can be cut with a knife.

Step 4 · Reactivity

Iron is much less reactive: it reacts slowly with water and oxygen, while sodium reacts rapidly.

Answer: Iron: higher melting point, denser, harder, less reactive

Check: A 'compare' answer names both metals in each point.

2. Now try one with the steps

Write the formulae of iron(II) chloride and iron(III) chloride. (2 marks)

Step 1 · Roman numerals give the charge

Step 2 · Balance the charges

Answer:

3. Practice

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

1. Give two physical properties of transition metals that differ from group 1 metals. [2]

2. Name the transition metal used catalyst in the Haber process. [1]

3. State the colour of copper(II) sulfate solution. [1]

4. Explain why sodium is stored under oil but iron is not. [2]
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5. Write the formula of iron(II) chloride. [1]
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6. Write the formula of iron(III) oxide. [1]
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7. Explain why iron can form two different chlorides. [1]
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8. Calculate the relative formula mass of iron(III) chloride, FeCl_3 . (Fe = 56, Cl = 35.5) [1]
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9. Calculate the relative formula mass of copper(II) sulfate, CuSO_4 . (Cu = 63.5, S = 32, O = 16) [1]
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10. A block of metal of volume 3.0 cm^3 has a mass of 26.7 g. Calculate its density in g/cm^3 . [2]
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11. Suggest why transition metals rather than group 1 metals are used to make saucepans. [2]
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12. A solid compound is coloured and speeds up a reaction without being used up. Suggest what type of element it contains, and give a reason. [2]
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13. Manganese(IV) oxide catalyses the decomposition of hydrogen peroxide. Explain why only a small mass of it is needed. [1]
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14. State the charge on the copper ion in copper(I) oxide, Cu_2O , and explain how you worked it out. [2]
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4. Before you hand it in

"Transition metals are more reactive than group 1 metals."

Group 1 metals react rapidly with water; most transition metals react slowly or not at all.

Ignoring the Roman numeral in a name

iron(II) = Fe^{2+} , iron(III) = Fe^{3+} . Use it to write the formula.

"A catalyst is used up slowly."

A catalyst is chemically unchanged at the end of the reaction.