

# Properties of Metals

## Question Paper

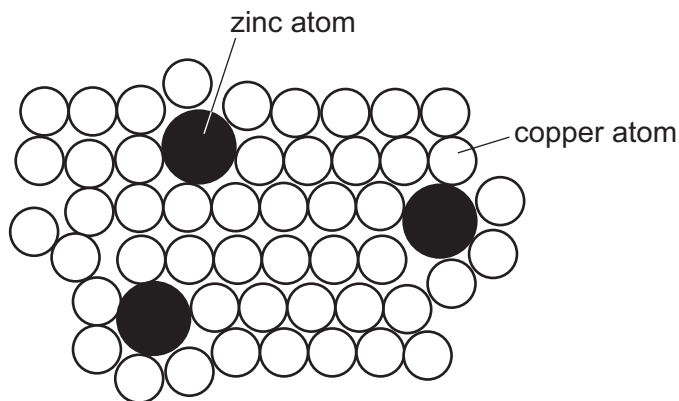
Level	O Level
Subject	Chemistry
Exam Board	Cambridge International Examinations
Topic	Metals
Sub-Topic	Properties of Metals
Booklet	Question Paper

**Time Allowed:** 18 minutes

**Score:** /15

**Percentage:** /100

- 1 The diagram shows the structure of brass.



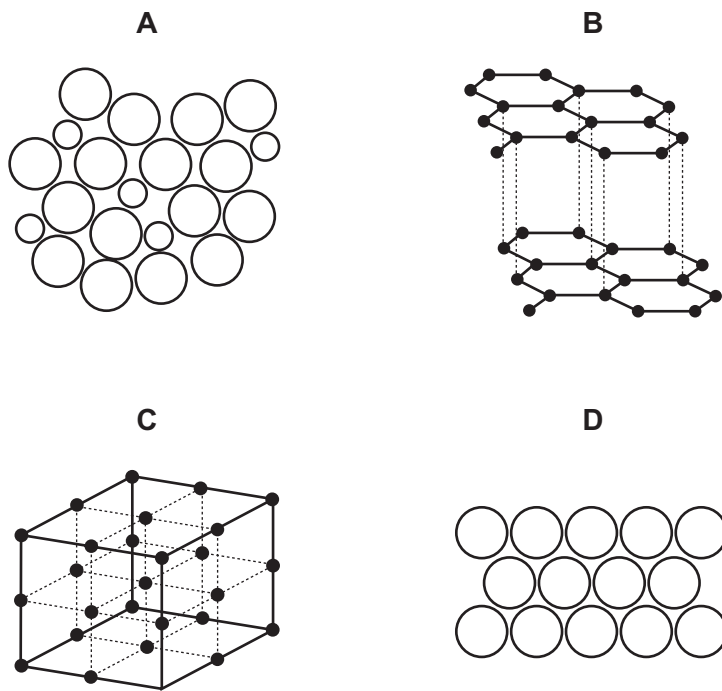
Why is brass harder than pure copper?

- A The zinc atoms form strong covalent bonds with copper atoms.
  - B The zinc atoms prevent layers of copper atoms from sliding over each other easily.
  - C The zinc atoms prevent the 'sea of electrons' from moving freely in the solid.
  - D Zinc atoms have more electrons than copper atoms.
- 2 Brass is an alloy.

Which statement about brass is correct?

- A It contains a sea of electrons.
- B It contains positive and negative ions which are free to move.
- C It is a compound of a metal and a non-metal.
- D It is a compound of two or more metals.

3 Which diagram shows the structure of an alloy?



4 Which two statements about alloys are correct?

- 1 Alloys are formed by mixing two metals.
- 2 Alloys do **not** conduct electricity.
- 3 Atoms in an alloy must all be the same size.
- 4 In an alloy there is metallic bonding.

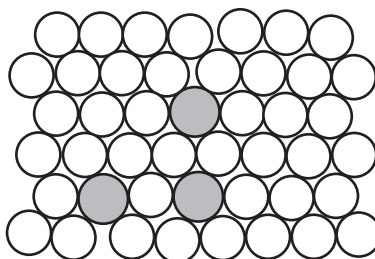
**A** 1 and 2

**B** 1 and 4

**C** 2 and 3

**D** 3 and 4

- 5 The diagram shows the structure of an alloy.



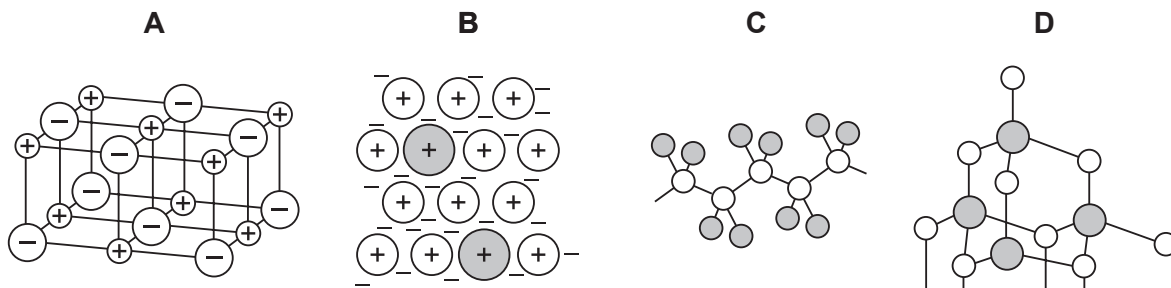
Which statement about alloys is correct?

- A** Alloys can only be formed by mixing copper or iron with other metals.
  - B** High carbon steel alloys are soft and easily shaped.
  - C** In an alloy there is attraction between positive ions and delocalised electrons.
  - D** The alloy brass has a chemical formula.
- 6 Metallic objects may be decorated by having very thin layers of gold applied to them.

Which properties of gold make it suitable for this use?

	it conducts electricity	it is malleable	it is unreactive
<b>A</b>	x	✓	✓
<b>B</b>	✓	x	✓
<b>C</b>	✓	✓	x
<b>D</b>	✓	✓	✓

7 Which diagram represents the structure of an alloy?



8 Alloys are usually harder than the metals from which they are made.

Which difference between the metals explains the greater hardness of alloys?

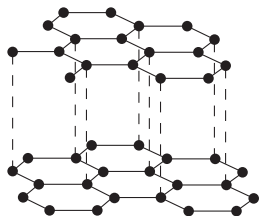
- A** atomic radius
- B** boiling point
- C** density
- D** malleability

9 A substance **Q** conducts electricity both when solid and molten.

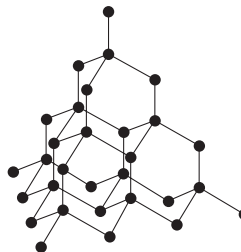
What is **Q**?

- A** an alloy
- B** a hydrocarbon
- C** a metal oxide
- D** a salt

10 The diagrams show the structures of two forms of carbon.



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Which set of data is correct for these two structures?

	conducts electricity	very hard material	can be used as lubricant
<b>A</b>	T		S
<b>B</b>	S		S
<b>C</b>	S		T
<b>D</b>	T		T

11 Substance **X** has a melting point higher than 500 °C. It is insoluble both in water and in organic solvents. It conducts electricity when both solid and molten.

What is **X**?

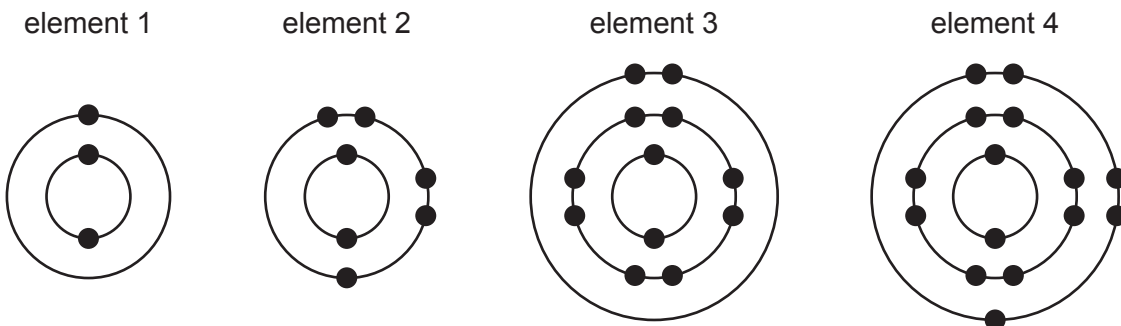
- A** copper
- B** mercury
- C** poly(ethene)
- D** sodium chloride

12 Alloys are usually harder than the metals from which they are made.

Which difference between the metals explains the greater hardness of alloys?

- A** atomic radii
- B** densities
- C** electrical conductivities
- D** relative atomic masses

13 The diagrams show the arrangements of the electrons of four elements.



Which two elements are metals?

- A 1 and 2
- B 1 and 3
- C 2 and 4
- D 3 and 4

14 How does the mass of a sample of copper(II) oxide change when it is heated in hydrogen and in oxygen?

	mass after heating in hydrogen	mass after heating in oxygen
A	decreases	decreases
B	decreases	unchanged
C	unchanged	decreases
D	unchanged	unchanged

15 Which diagram represents the structure of the metal sodium?

