

25 Brass is an alloy of copper.

Which statement about brass or copper is correct?

- A Brass does **not** conduct electricity because it is a compound.
- B Copper conducts electricity because its atoms are free to move.
- C Brass is harder than copper because its layers of atoms **cannot** easily slide over each other.
- D Copper is stronger than brass because it is a pure metal.

26 Brass is a mixture of copper and zinc.

Which statement describes and explains the relative strength of brass compared to copper?

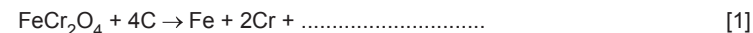
- A Brass is stronger than copper because the layers of atoms in brass **cannot** easily slide over each other.
- B Brass is stronger than copper because the intermolecular forces are greater in brass than in copper.
- C Brass is weaker than copper because the layers of atoms slide more easily over each other in brass than in copper.
- D Brass is weaker than copper because the intermolecular forces are weaker in brass than in copper.

4 Chromium is the element with atomic number 24 in the Periodic Table.

(a) The main ore of chromium is chromite. Chromite contains FeCr_2O_4 .

FeCr_2O_4 reacts with carbon.

(i) Complete the equation for this reaction.



(ii) Suggest **one** disadvantage of extracting chromium by reacting chromite with carbon.

..... [1]

(b) Chromium can be mixed with nickel and other elements to form stainless steel.

Name the type of substance formed when a metal is mixed with other elements.

..... [1]

(c) $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ is a compound containing chromium.

The negative ion in $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ is $\text{Cr}_2\text{O}_7^{2-}$.

(i) State the sum of the oxidation numbers in the $\text{Cr}_2\text{O}_7^{2-}$ ion.

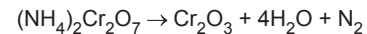
..... [1]

(ii) The oxidation number of each O in $\text{Cr}_2\text{O}_7^{2-}$ ions is -2 .

Determine the oxidation number of each Cr in $\text{Cr}_2\text{O}_7^{2-}$ ions. Show your working.

..... [2]

(iii) When $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ is heated the following reaction occurs.



Calculate the volume of nitrogen gas produced at r.t.p., in cm^3 , when 1.26 g of $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ is heated using the following steps.

The M_r of $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ is 252.

- Calculate the number of moles of $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ used.

..... mol

- Determine the number of moles of N_2 formed.

..... mol

- Calculate the volume of N_2 formed at r.t.p. in cm^3 .

..... cm^3
[3]

[Total: 9]

28 Which statement about alloys is correct?

- A** Alloys are harder than pure metals because they contain strong intermolecular forces.
- B** Brass is an alloy containing mainly copper and tin.
- C** The different-sized atoms in an alloy mean that the layers **cannot** easily slide over each other.
- D** There are no alloys containing carbon because carbon is a non-metal.