Chemistry 2.4 AS 91164 Demonstrate understanding of bonding, structure, properties and energy changes

Writing Excellence answers to **Solids – Melting Point** questions

Solids – Melting Point QUESTION

Question: Explain why chlorine is a gas at room temperature, but copper chloride is a solid at room temperature.
In your answer, you should refer to the particles and the forces between the particles in **both** substances.
(you will need to fill in the chart below correctly as part of the question and use the terms in your answer)

Substance	Type of substance	Type of particle	Attractive forces between particles
$Cl_{2\ (s)}$ chlorine	Molecular	Molecules	Weak intermolecular forces
$CuCl_{2(s)}$ copper chloride	Ionic	Ion	Ionic bonds / electrostatic attraction

ANSWER

1. For the first substance (name) state the **type of solid** that it is	Chlorine is a molecular substance
2. describe the **structure** of this type of substance using the *terms* above in the table	composed of chlorine molecules held together by weak intermolecular forces
3. explain how the **bonding** relates to the energy required to break bonds of your substance	The weak intermolecular forces do not require much heat energy to break, so the boiling point is low (lower than room temperature);
4. link to the **observation** (state at room temperature) in your question for the first substance	therefore chlorine is a gas at room temperature.
5. For the second substance (name) state the **type of solid** that it is	Copper chloride is an ionic substance.
6. describe the **structure** of this type of substance using the *terms* above in the table	It is composed of a lattice of positive copper ions and negative chloride ions held together by electrostatic attraction (ionic bonds) between these positive and negative ions.
7. explain how the **bonding** relates to the energy required to break bonds of your substance	These are strong forces, therefore they require considerable energy to disrupt them and melt the copper chloride;
8. link to the **observation** (state at room temperature) in your question for the first substance	hence copper chloride is a solid at room temperature.

NOTE: The white column is how your answer would appear on your test paper so make sure you **write out complete sentences**. The grey area is just to help you structure your answer and would not appear in the question.