

Unit 8 – Advanced Bonding Concepts

C4.3c Compare the relative strengths of forces between molecules based on the melting point and boiling point of the substances.

C4.3d Compare the strength of the forces of attraction between molecules of different elements (e.g., at room temperature, chlorine is a gas and iodine is a solid).

C4.3e Predict whether the forces of attraction in a solid are primarily metallic, covalent, network covalent, or ionic based upon the elements' location on the periodic table.

C4.3f Identify the elements necessary for hydrogen bonding (N, O, F).

C4.3g Given the structural formula of a compound, indicate all the intermolecular forces present (dispersion, dipolar, hydrogen bonding).

C4.3h Explain properties of various solids such as malleability, conductivity, and melting point in terms of the solid's structure and bonding.

C4.3i Explain why ionic solids have higher melting points than covalent solids (e.g., NaF has a melting point of 995°C while water has a melting point of 0° C).

C5.4c Explain why both the melting point and boiling points for water are significantly higher than other small molecules of comparable mass (e.g., ammonia and methane).

C5.4d Explain why freezing is an exothermic change of state.

C5.4e Compare the melting point of covalent compounds based on the strength of IMFs (intermolecular forces).

AMAESD Power Standard

C4.3x Solids can be classified as metallic, ionic, covalent or network covalent. Different solids have different properties that depend on the particles and forces. 4.3c-I, 5.4c, 5.5e

I can classify solids based on particles and forces.

I can distinguish between a metallic, ionic or network covalent solid.