

Ionic, Covalent, and Metallic Bonding

Student Worksheet | g09_u06_w21

I can: classify bonding models, connect structure to properties, and distinguish chemical bonds from intermolecular forces.

Vocabulary: ionic bond, covalent bond, metallic bond, lattice, electron sharing, conductivity, intermolecular force.

1. Define ionic bonding in a grade-appropriate model.

2. Define covalent bonding.

3. Define metallic bonding model.

4. Which bond model fits NaCl?

5. Which bond model fits CO₂ within molecule?

6. Which model fits Cu metal?

7. Why do ionic solids conduct poorly as solids but often conduct when molten/dissolved?

8. Why can metals conduct as solids?

9. Why do many molecular substances have lower melting points than ionic lattices?

10. Is a covalent bond the same as an intermolecular force?

11. Classify diamond-like network solid versus wax by strongest structural model.

12. A substance is brittle, high melting, and conducts when molten. Predict bond model.

13. A substance is malleable and shiny. Predict model and evidence limit.

14. Explain why formula alone does not prove a material's conductivity.

15. State what happens energetically when a chemical bond is broken.

16. State what happens energetically when a chemical bond forms.

17. Make a property table for ionic, molecular-covalent, metallic: particles/structure/conductivity.

18. Data: A melts at 800 C and conducts only molten; B melts at 20 C and does not conduct; C conducts solid and bends. Match A/B/C to models.

19. A student says water's intermolecular forces are covalent bonds. Correct using levels of structure.

20. Critique: "Breaking a bond releases stored energy."
