

Grade 10 Chemistry Worksheet: Matter and Intermolecular Forces

Student Name: _____

Grade: 10 Subject: Chemistry Date: _____

Total: 34 marks

Section A: Multiple Choice

Choose the best answer. Circle **A, B, C, or D**. Each question is worth **1 mark**.

1. Which is an extensive property of a sample of matter?

- A. Density
- B. Melting point
- C. Mass
- D. Boiling point

2. Which property is intensive?

- A. Volume
- B. Mass
- C. Amount of substance
- D. Density

3. A large piece of copper is cut into two smaller pieces. Which property stays the same for both pieces, if they are at the same conditions?

- A. Mass
- B. Volume
- C. Density
- D. Total number of atoms

4. What are intermolecular forces?

- A. Attractions between separate molecules
- B. Bonds joining atoms within a molecule
- C. Forces that only occur in metals
- D. Forces that make particles disappear

5. Stronger intermolecular forces usually make it:

- A. Easier for molecules to escape from a liquid
- B. Harder for molecules to separate from one another
- C. Impossible for a liquid to evaporate
- D. Easier for a solid to melt at a lower temperature

6. What is vapor pressure?

- A. The pressure of a liquid pushing on the bottom of its container
- B. The pressure exerted by vapor above a liquid in a closed container

- C. The pressure of air trapped inside a solid
 - D. The force that holds a liquid in a container
7. At the same temperature, which liquid is likely to have the higher vapor pressure?
- A. The liquid with stronger intermolecular forces
 - B. The liquid with weaker intermolecular forces
 - C. The liquid with the greater volume
 - D. The liquid with the greater mass
8. In a closed container, dynamic equilibrium occurs when:
- A. Evaporation stops completely
 - B. Condensation stops completely
 - C. Evaporation and condensation happen at equal rates
 - D. All the liquid changes into vapor
9. At dynamic equilibrium, what happens to the amount of liquid and vapor?
- A. Their amounts stay constant overall
 - B. The amount of liquid always increases
 - C. The amount of vapor always decreases
 - D. Both amounts become zero
10. Which statement describes a crystalline solid?
- A. Its particles have no repeating arrangement
 - B. Its particles are arranged in an orderly, repeating pattern
 - C. It is made of particles that move freely past one another
 - D. It always softens over a range of temperatures
11. Which is an example of an amorphous solid?
- A. Table salt
 - B. Quartz crystal
 - C. Glass
 - D. Ice crystal
12. Compared with a crystalline solid, an amorphous solid generally:
- A. Has a less orderly particle arrangement
 - B. Has particles that form a regular repeating pattern
 - C. Is always a liquid
 - D. Has no particles
13. Cohesion is the attraction between:
- A. Particles of different substances
 - B. Particles of the same substance
 - C. A liquid and a gas only
 - D. A solid and a gas only
14. Adhesion is the attraction between:
- A. Particles of the same substance
 - B. Particles of different substances

- C. Only molecules in a gas
- D. Only atoms in a crystal

15. Water forms a curved meniscus in a glass tube because:

- A. Adhesion and cohesion both affect the shape of the water surface
- B. Water has no attraction to glass
- C. Gravity makes water molecules stop moving
- D. Vapor pressure pulls the water upward

Section B: Short Answer

Answer each question in a few complete sentences. Each question is worth **2 marks**.

16. Explain the difference between an extensive property and an intensive property. Give one example of each.

17. Describe dynamic equilibrium between evaporation and condensation in a closed container.

Section C: Long Answer

Answer each question in complete sentences. Use scientific terms and explain your reasoning. Each question is worth **5 marks**.

18. Two liquids are at the same temperature. Liquid X has stronger intermolecular forces than Liquid Y. Compare how easily each liquid evaporates and its vapor pressure. Explain your answer.

19. Compare crystalline solids and amorphous solids. Describe how their particles are arranged and explain how their melting behavior can differ. Include one example of each type.

20. A drop of water is placed on clean glass. Explain how cohesion and adhesion affect the shape of the drop. State what happens when attraction between water and glass is stronger than attraction between water molecules.

Answer Key

Section A: Multiple Choice

1. **C** — Mass depends on the amount of matter, so it is extensive.
2. **D** — Density does not depend on the amount of a substance, so it is intensive.
3. **C** — Cutting the copper changes its size, but not its density under the same conditions.
4. **A** — Intermolecular forces are attractions between separate molecules.
5. **B** — Stronger attractions require more energy to separate molecules.
6. **B** — Vapor pressure is exerted by vapor above a liquid in a closed container.
7. **B** — Weaker attractions let more molecules escape into the vapor, increasing vapor pressure.
8. **C** — At dynamic equilibrium, evaporation and condensation continue at equal rates.
9. **A** — Equal rates of evaporation and condensation keep the amounts constant overall.
10. **B** — Crystalline solids have a regular, repeating particle arrangement.
11. **C** — Glass is an amorphous solid with no regular repeating arrangement.
12. **A** — Amorphous solids lack the orderly, repeating structure of crystals.
13. **B** — Cohesion is attraction between particles of the same substance.
14. **B** — Adhesion is attraction between particles of different substances.
15. **A** — Both the attraction among water molecules and their attraction to glass shape the surface.

Section B: Short Answer

16. **Model answer:** An extensive property changes when the amount of a substance changes. Mass is an example. An intensive property does not depend on the amount; density is an example.
17. **Model answer:** In a closed container, liquid molecules evaporate into vapor while vapor molecules condense back into liquid. At dynamic equilibrium, both processes continue at equal rates, so the amounts of liquid and vapor stay constant overall.

Section C: Long Answer

18. **Model answer:** Liquid Y evaporates more easily because its molecules have weaker intermolecular forces and need less energy to escape the liquid. Liquid X evaporates less easily because its stronger attractions hold its molecules together. Therefore, at the same temperature, Liquid Y generally has a higher vapor pressure than Liquid X.
19. **Model answer:** Particles in a crystalline solid are arranged in an orderly, repeating pattern; table salt is an example. Particles in an amorphous solid do not have a regular repeating pattern; glass is an example. A crystalline solid generally melts at a distinct temperature, while an amorphous solid usually softens over a range of temperatures.

20. **Model answer:** Cohesion attracts water molecules to one another, while adhesion attracts water molecules to the glass. If adhesion to the glass is stronger than cohesion between water molecules, water spreads along the glass and curves upward at the edges. The balance between these attractions determines the drop's shape.