

Physical Nature and States of Matter

Chapter 1: Matter in Our Surroundings · Topic 1

Key Concept

These physical properties translate into measurable characteristics: solids have high density and low compressibility, gases have low density and high compressibility, with liquids falling in between. The kinetic theory of matter explains that all particles possess kinetic energy and are in constant motion, with this energy increasing as temperature rises, which is why heating a substance generally causes it to move from solid to liquid to gas as intermolecular forces are progressively overcome.

Quick Revision Notes

- Solids: fixed shape/volume, particles tightly packed with strong forces.
- Liquids: fixed volume, particles close but can flow.
- Gases: no fixed shape/volume, particles widely spaced.
- Kinetic theory: particles possess kinetic energy that increases with temperature.

Practice Questions

- 1 Explain why gases can be compressed but solids cannot.
- 2 Describe how kinetic theory explains the change from solid to liquid to gas upon heating.
- 3 Compare the density of solids, liquids, and gases.