Chapter 2: Kinetic Particle Theory

What is Matter?

- Matter takes up space and has mass.
- It can exist in 3 different physical states: solid, liquid and gas
- Kinetic Particle Theory states that:
 - Matter is made up of <u>tiny particles</u>. These tiny particles can be atoms, ions or molecules.
 - The particles have kinetic energy and hence are in <u>constant</u> and random motion..

Particulate model of matter

• Used to explain the properties and characteristics of matter in different physical states.

	Solid	Liquid	Gas
Arrangement of particles	Close together	Close together	Far apart
	Regular pattern	Random arrangement	Random arrangement
Movement of particles	Vibrate on the spot	Move around each other	Move quickly in all directions
Diagram			

Using the particulate model of matter to explain common properties and characteristics of matter

Physical State	Properties	Explanation
Solids	Fixed volume and shape	 The particles are arranged in a fixed position and a regular pattern
	Not compressible	 Particles are closely packed together so there are little spaces to squeeze
	Not able to flow	 Can only vibrate in their fixed position.

Physical State	Properties	Explanation
Liquid	Fixed volume but not fixed shape	 Moderately strong attractive force prevents them from escaping from their positions. However, the particles can move about and slide past each other freely.
	Able to flow easily	 The particles are able to move about and slide past each other.
	Not compressible	 The particles are arranged quite closely together so there are less spaces between them
	Take up shape of container	 Particles are able to move about within confined places
Gas	No fixed volume and shape	 The particles can move freely and randomly in all available spaces. The negligible attractive force is not able to hold them in confined spaces.
	Compressible	 The particles are far apart from each other, so they are more spaces between them
	Flow easily	 Particles move freely at high speeds
	Take shape and volume of container	 The particles are able to move freely in all directions to occupy every corner of the container

Combined Chemistry KPT NOTES

Heating/Cooling Curve A. Heating Curve



Melting State: Solid + Liquid Boiling State: Liquid + Gas

B. Cooling Curve



Condensation State: Liquid + Gas Freezing State: Solid + Liquid