

SUBJECT: BASIC SCIENCE
TOPIC: TYPES OF ENERGY
DATE:8/01/2024
CLASS:JS 2

TYPES OF ENERGY

- Energy comes in many different forms, which can be categorized into two basic types **kinetic** and **potential** energy.

ENERGY

Energy is what makes matter move or change.



KINETIC ENERGY

Energy of motion

Energy that comes from movement

Mechanical Energy

Energy due to motion of an object



Electrical Energy

Energy from flow of electric charge



Thermal Energy

or heat energy. is vibration or movement of particles



Radiant Energy

or light energy. is electromagnetic energy that travels in transverse waves



Sound Energy

vibration transferred through an object in a wave to produce sound



POTENTIAL ENERGY

Stored energy

Energy that is stored for later use

Chemical Energy

Energy stored in bonds of atoms and molecules



Nuclear Energy

Energy stored in atoms' nuclei



Gravitational Energy

Energy stored in an object's height



Elastic Energy

Energy stored in elastic objects



KINETIC ENERGY

- is the energy that a body has because of its motion. The kinetic energy of an object depends on its mass and velocity. An object has more kinetic energy if it has a greater mass or a higher velocity. The formula for kinetic energy is :
 - Kinetic energy = $\frac{1}{2}mv^2$
 - Where: m=mass of the body measured in kilogram (kg)
 - V= velocity of the body measured in m/s
 - The S.I unit of kinetic energy is joule(j)

KINETIC THEORY OF MATTER

Kinetic theory of matter states that “all matter is made up of particles that are in constant motion and therefore possess kinetic energy.”

- Kinetic theory explains change of state of matter by considering the fact that all matters is made up of particles. All the three states of matter can change their state from one form to another.

MOLECULAR STRUCTURE OF SOLIDS

- The particles in solids are close to one another and the attractive forces between them are strong.
- The particles are arranged in a regular pattern
- The forces of attraction between the particles hold the particles in a fixed position
- When solid are heated, the molecules vibrate faster and increase in kinetic energy

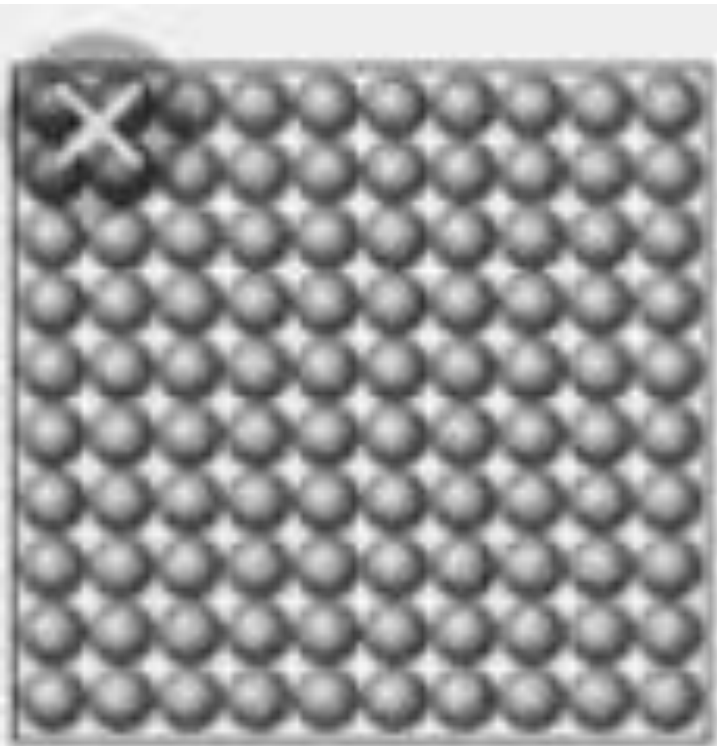
MOLECULAR STRUCTURE OF LIQUID

- The liquid particles are closely packed in a random arrangement
- The attractive forces between the particles are weaker when compared with the particles of solid
- The movement of the particles in a liquid is restricted to the space occupied by the liquid

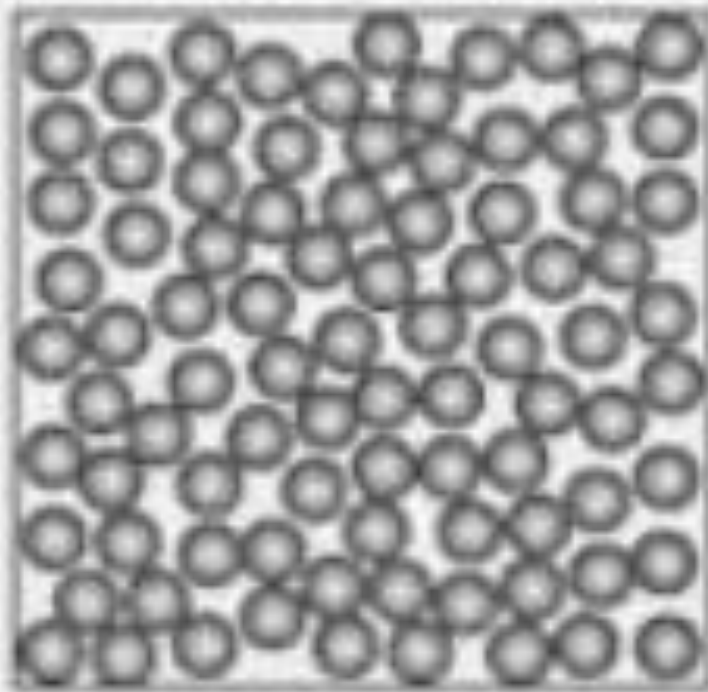
MOLECULAR STRUCTURE OF GASES

- The particles in gases move quickly in all directions. They are very loose and completely fill the container in which they are put.
- The forces of attraction between the particles are very weak. Therefore, the particles move away from one another.
- The particles in gases hit one another and the wall of the container in their random motion.

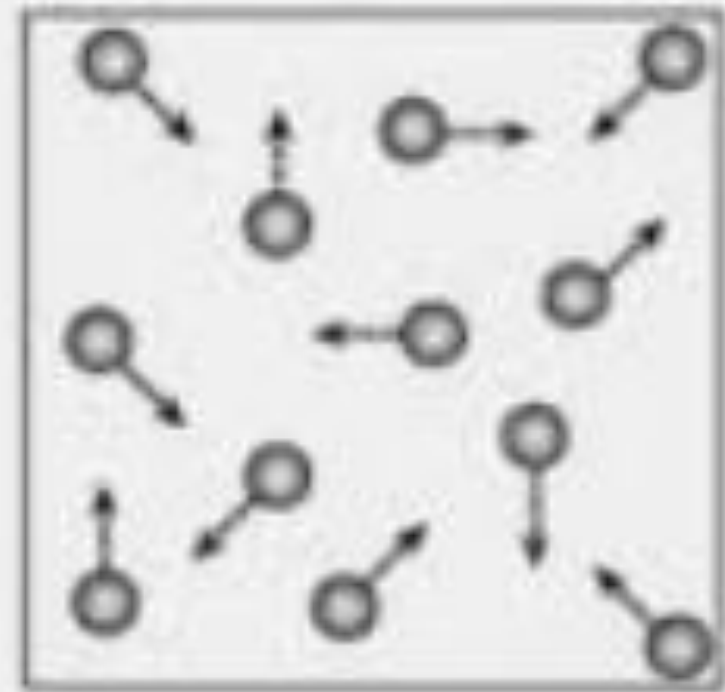
MOLECULAR STRUCTURE OF SOLID, LIQUID AND GAS



Solid



Liquid



Gas

KINETIC ENERGY ASSUMPTIONS

The kinetic theory assumes that:

1. In the solid state, the molecules are more or less in fixed positions, so they hardly move.
2. In the liquid state, the movement of the molecules are less restricted and that is why a liquid flows to assume the shape of its container.

3. In the gaseous state,

- (i) Gas molecules are in constant motion in random directions and short, straight lines, colliding with one another and with the walls of the container;
- (ii) Gas molecules exerts neither attractive nor repulsive forces on one another; and
- (iii) The average kinetic energy of the molecules is proportional to the temperature (in kelvin) and pressure.

EXPLANATION OF SOME PHENOMENA USING KINETIC THEORY

- (i) The behaviours of solids , liquids and gases under different temperatures and pressures
- (ii) The large increase in the volume of a liquid when converted to vapour
- (iii) Why there is only a small amount of hydrogen or helium in earth's atmosphere compared to Jupiter's.
- (iv) Why substances can exist as solid, liquid or gas
- (v) Why a solid has shape, while liquid and gas has none.

FACTORS THAT AFFECT EVAPORATION

1. Temperature
2. Pressure
3. Wind
4. Type of liquid and its vapour pressure

SUBLIMATION

- Sublimation is a phenomenon in which solid substances, when heated change directly to a gas, or a gas when cooled changes directly to solid without passing through the intermediate liquid state.
- Sublimation is an endothermic.
- Examples: are ammonium chloride, iodine, camphor, naphthalene,
- Dry ice, water cycle, mothball, dye-sublimation printing, forensics, perfume tablets, accretion of matter in space. Etc.

CLOUD, MIST AND FOG

- Mist: is defined as the layer of cloud, that is created due to the volcanic activities, changes in the level of temperature and humidity.
- Mist is the thin layer of floating water droplet located on the ground.
- A cloud is thick with heavy condensed water hanging high in the sky, far away from the ground.
- Fog is the less thick condensed water located below the cloud.

CONDENSATION

- This is the process where by a gas changes into liquid as a result of cooling. In this, heat energy, which is the kinetic energy is not gained, rather it is lost from the gaseous substance.
- The kinetic energy reduces to a level where it cannot resist and break the binding force; then the particles are closely pulled together, and change to liquid.