

Kinetic Theory of Matter

- All matter is made up of tiny particles called molecules.
- These molecules are constantly in motion.
- They have a strong attraction when close to each other.
- They have kinetic energy because they are moving and potential energy because their motion keeps them separated.

Heat: The total kinetic energy and potential energy of all the molecules in an object or substance/
internal energy.

Temperature: The intensity of heat present in an object or substance.

Energy transferred is Heat

- It travels from a high temperature to a low temperature.

Kelvin scale is used because it is the absolute absence of thermal energy.

Temperature(K)=Temperature(C)+273

Why is mercury used in thermometers:

Mercury has the capacity to expand to low increments in change of temperature, which denotes that it has a high sensitivity to ΔT . Mercury is the only substance that has an upper meniscus instead of a lower meniscus. Mercury is not cohesive to the wall of the thermometers.

Damp is not as heavy as dry air, which means it's not buoyant enough to carry smoke in the air which justifies the chimney experiment.

Measurement of quantity of heat-Calorimetry

SI unit for heat: Joules

Heat capacity: The amount of heat energy required to raise the temperature of any object by 1^o kelvin or Celsius.

Heat capacity depends on the material and is directly proportional to the mass of the object or substance.

Specific Heat Capacity-C

Heat Energy Supplied- Q

Mass-M

Temperature Change- ΔT

$$Q = MC\Delta T$$

Specific heat capacity is the amount of energy required to change an object or substances with a mass of 1kg temperature by 1 degree kelvin or Celsius.

Material	SHC(J)
Cu	380
Glass	670
Ice	2100
Water	4200

Latent Heat: Heat energy required to change the state of an object from one to another. It is hidden energy and does not change temperature; this is when the particles are at the point of changing temperature, and the rest of the energy is contributed to changing the state of the matter.

Solid-Liquid Latent heat of fusion

Liquid to Gas-Latent heat of vaporization

Latent heat of Fusion:

Q=Heat Energy Supplied

M=Mass

L=Latent energy

$$Q=mL$$

Latent energy=J/kg

Specific Latent heat is how much heat is required for 1kg of a substance to change state without changing temperature.

Evaporation requires heat energy and causes cooling, evaporation occurs at the surface of a liquid, evaporation occurs at all temperatures of a substance, faster molecules escape the water and become a gas, slower molecules remaining in the liquid lower the average energy of the molecules in the liquid. So evaporating molecules leave a cooler liquid behind.

How is heat transferred: Heat transfer occurs when particles are excited and, incidentally, they collide with other particles causing many to get excited and for heat to transfer, many collisions must occur.