

States of matter

Q-1) Kinetic molecular theory? (KMT)

>

- ① The volume occupied by the gas molecules is negligible.
↳ distance between the molecules is much greater than the diameter of the molecules.
- ② No intermolecular forces exist between the gas molecules/atoms.
↳ no attractive & repulsive forces.
- ③ Gas molecules are in a state of continuous and random motion.
↳ Brownian motion.
- ④ The collisions between the gas molecules are ^{perfectly} ~~completely~~ elastic.
↳ no energy is lost : (KE conserved)
- ⑤ Average energy of the gas particles depends on the temperature of the gas.

* Ideal gas : obeys KMT

↳ approaches ideal behaviour at low pressure & high temperature.

* Real gas : doesn't obey KMT

↳ approaches ideal behaviour at ^{low} high pressure & ^{high} ~~low~~ temperature.

Q-2) Gas laws.

> Boyle's law (temperature constant)

$$PV = \text{constant}$$

> Charles law (pressure constant)

$$\frac{V}{T} = \text{constant}$$

> Avogadro's constant

$$1 \text{ mol} = 6.02 \times 10^{23} \text{ particles.}$$

$$1 \text{ mol} = 22.4 \text{ litres}$$

> Ideal gas law

$$pV = nRT$$

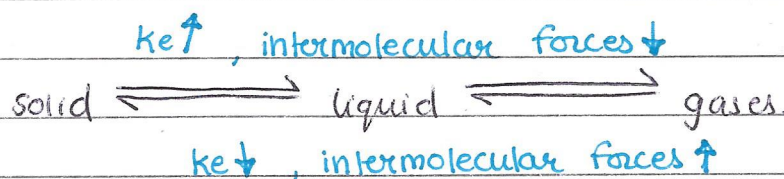
Celsius $\xrightarrow{+273}$ kelvin

P = pressure (Pa)

V = volume (m^3)R = gas constant $\rightarrow 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$

T = temperature (K)

Q-3) Solid, liquid & gas state.



Pressure exerted by a vapour, in equilibrium with its liquid is called **vapour pressure**.

Q-4) Structures.

① Giant ionic lattice.

- NaCl

- MgO

* hard, high MP & BP ; strong forces of attraction between

+ve and -ve ions.

* brittle ; repulsion between ions at a point.

* soluble

* conduct electricity when molten.

② Giant metallic.

- D block in periodic table & group I & II.

* High mp & BP ; +ve ions & sea of e^-

* malleable

③ Simple molecular

- H_2 , Cl_2

- CO_2

- H_2O

* weak mp & BP ; VVF.

④ Giant molecular.

- SiO_2

- graphite, diamond.

different structures of the same element are called **allotropes**.
(carbon).

* covalent bonding.

⑤ Simple atomic

- All inert gases

↳ He, Ar...

①-4) What are ceramics?

> A ceramic is an in-organic non-metallic solid which is prepared by heating a substance or a mixture of substances to a high temperature.

→ giant molecular structure.

↳ covalent bonds

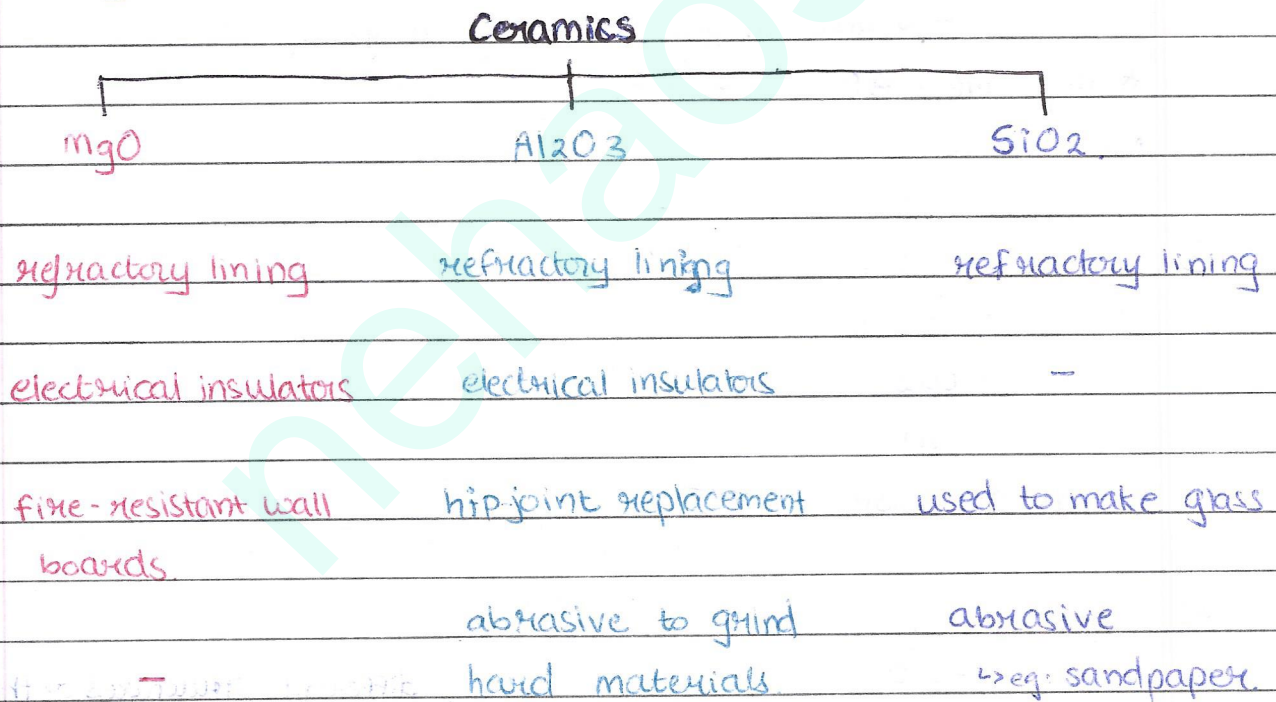
* high MP & BP \rightarrow covalent bonds

* doesn't conduct electricity or heat \rightarrow no free e^- or ions.

* hard \leftrightarrow

* chemically unreactive \rightarrow no free e^- .

uses



Q-5) Why recycle materials?

- saves energy
- conserves supplies of the ore
- less waste in landfills
- cheaper than extracting ore and its purification
- saves transportation costs