

## The Solid State

Matter can exist in three states:

- i) Solid ii) Liquid iii) gas

Under a given set of conditions of temperature and pressure which of these would be the most stable state of a given substance depends upon the net effect of two opposing factors:

- i) Intermolecular forces (IF)  
ii) Thermal energy (TE)

$TE \gg IF$  (Gas),  $TE > IF$  (Liquid),  $IF \gg TE$  (Solid)

Properties of solids:

- i) They have definite mass, volume and shape
- ii) Intermolecular distances are short.
- iii) Intermolecular forces are strong.
- iv) Their constituent particles (atoms, molecules, ions) have fixed positions and can only oscillate about their mean position
- v) They are incompressible and rigid.