where, μ = dipole moment of polar molecule, α = polarisability of non-polar molecule
r = dist. b/w 2 molecules.

3. Instantaneous dipole induced dipole interactions – (London forces)
These forces are found in non-polar molecules. It is supposed that the symmetrical movement of e^- cloud becomes unsymmetrical for frac^n of a second. Thus, one end gets +ve & other -ve. This dipole induces an instantaneous dipole temporarily. The atoms (molecules) get attracted to each other due to the mild electrostatic force of attr^n b/w instantaneous dipole & induced dipole. These are responsible for the condensation of gases.

Vander Waals forces $E = E_K + E_D + E_L$

Characteristics of Vander Waal's forces –
1. Short range forces. Imp. upto 10^{-7} cm
2. much weaker than covalent & H-bonds.

Application –
Since Vander Waal forces are easily overcome, the condensed gas readily vaporises & molecular crystals are soft, they have low M.P.

Factors Affecting magnitude of Vander Waal's forces –
1. No. of e^- present in a molecule → mag. of vander waal's force ↑ as no. of e^- in molecule ↑. B.P ↑ as vander waals force ↑
2. Molecular Mass → Higher the molecular mass, stronger is the vander waal's force, hence B.P. will ↑.