

Hot Plasma :-

Plasmas are generally electrically neutral, which means that they are made up of positively and negatively charged particles. They are fully ionized. In thermal plasma energy is used to heat the entire gas, an temperature often range from $10,000 - 100,000 \text{ K}$.

A plasma is an electrically neutral medium of unbound positive and negative particles showing a collective behaviour.

- * The no. of negative charge particle must be equal to the no. of positive charge. In the simplest case of an atom losing only one electron, it means that the no. of free electrons must be equal to the no. of ions. This is called plasma approximation.
i.e. $n_e = n_i$

- * Debye length is much smaller than λ i.e. $\lambda_D \ll \lambda$.

- * If ω is the frequency of typical plasma oscillations and T is the mean time between collision with neutral atoms, then $\omega T > 1$ for the gas to behave like plasma rather than a neutral gas.

Cold Plasma :-

cold plasma (or non-equilibrium plasma) is the plasma where the temperature of the individual constituents are different from each other. Electrons are at higher temperature (more than $10,000\text{ K}$) and neutral atoms are at room temperature. However, the density of electrons in the is very low compared to the density of the neutral atoms. In the laboratory, cold plasmas are generally produced by the provision of electrical energy to different inert gases. This can be done at room temperature and at atmospheric pressure. Although they have high temperature but actually when you touch them you do not feel hotness.