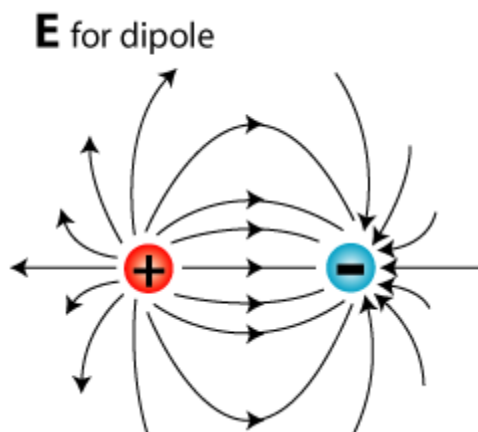


Answer on Question #43878, Physics, Other

What is an electric dipole?

Answer:

An electric dipole is two charged objects, with equal but opposite electric charges, that are separated by some (usually small) distance. A permanent electric dipole is called an electret.



Electric field produced by a dipole is known as dipole field.

Let $+q$ and $-q$ be equal and opposite point charges separated by a small distance $2l$. The strength of an electric dipole is measured by a vector quantity known as electric dipole moment known as electric dipole moment, which is the product of the charge and separation between the charges, that is

$$\vec{P} = q \times 2l$$

The direction of \vec{P} is always from negative to positive. The SI unit of dipole moment is Coulomb-meter.

Many molecules have such dipole moments due to non-uniform distributions of positive and negative charges on the various atoms. Such is the case with polar compounds like hydrogen fluoride (HF), where electron density is shared unequally between atoms. Therefore, a molecule's dipole is an electric dipole with an inherent electric field.

A dipole can be created, for example, when you place a neutral atom in an electric field, because the positively-charged constituents of the atom will be pulled one way, and the negatively-charged constituents the other way, creating a separation of charge in the direction of the field.

