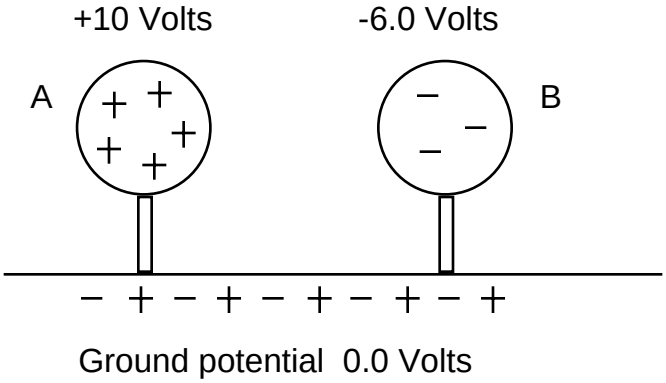
Electrostatics 3 : Notes-30

Voltage concept

When charge is separated, that is, when negative charge is moved away from a stationary positive charge, work has to be done.

If electrons are removed from an insulated metal sphere, the potential of the sphere may be +10. volts. One volt equals one joule per coulomb.

If electrons are brought to another similar insulated metal sphere, the potential may be -6.0 volts. The voltage (or potential) depends on the number of coulombs and the sign of the charge. Voltage is relative.



Ground potential 0.0 Volts

Ground potential equals 0.0 volts. This is because the ground or Earth has a neutral charge.

The potential difference equals $V_2 - V_1$. The potential difference between A and B is 10.0- -6.0 = 16.0 volts. The potential difference between A and ground is +10 volts. The potential difference between B and ground is -6.0 volts.

If a wire is connected from B to the ground, electrons will flow from B into the ground. If a wire is connected from A to the ground, electrons will flow from the ground to A.

If A is connected to B, electrons will flow from B to A. The final voltage for both spheres will be equal to +2.0 volts.