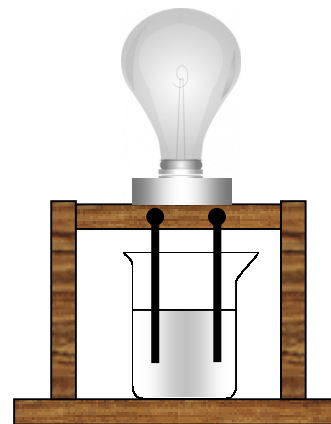


Evidence for ions

Chemists have long believed in the existence of atoms. In addition, we can safely subscribe to the notion that individual atoms and groups of ions can exhibit permanent charges. These particles are called ions.

Many compounds, which when dissolved in water, will break apart to form ions, one which is positive in charge and one which is negative. The neutrality of the solution is maintained by an equal amount of positive charge and negative charge.



We can test for the presence of ions using a conductivity tester. The tester consists simply of a line-cord with a standard plug at one end for connecting it to 110V house current. One side of the wire goes to one electrode and the other to the base of the lamp. When a beaker contain a solution of ions connects the two electrodes the circuit is complete and the light bulb lights up. This indicates the presence of ions.

In a demonstration, it is shown that pure water does not dissociate into ions and the light bulb does not light. As a small amount of hydrochloric acid is added to the water in the tester, the filament in the lamp begins to glow, indicating that the small number of ions causes some conductivity. As additional hydrochloric acid solution is added to the water, the concentrations of ions increases and the brightness of the lamp increases until it is equal to the brightness when a wire connected the two electrodes.

Not all compounds which dissolve in water form ions, hence the need for the tester. The first three do not cause the lamp to light. The last four do.

