Electronegativity

Valence electrons hold atoms together in chemical compounds. In many compounds, the negative charge of the valence electrons is concentrated closer to one atom than to another. This uneven concentration of charge has a significant effect on the chemical properties of a compound. It is therefore useful to have a measure of how strongly one atom attracts the electrons of another atom within a compound.

Linus Pauling, one of America's most famous chemists, devised a scale of numerical values reflecting the tendency of an atom to attract electrons. **Electronegativity** *is a measure of the ability of an atom in a chemical compound to attract electrons from another atom in the compound.* The most electronegative element, fluorine, is arbitrarily assigned an electronegativity value of four. Values for the other elements are then calculated in relation to this value.

Period Trends

As shown in ***Figure 20,*** *electronegativities tend to increase across each period, although there are exceptions.* The alkali and alkaline-earth metals are the least electronegative elements. In compounds, their atoms have a low attraction for electrons. Nitrogen, oxygen, and the halogens are the most electronegative elements. Their atoms attract electrons strongly in compounds. *Electronegativities tend to either decrease down a group or remain about the same.* The noble gases are unusual in that some of them

FIGURE 20 Shown are the electronegativities of the elements according to the Pauling scale. The most-electronegative elements are located in the upper right of the *p* block. The least-electronegative elements are located in the lower left of the *s* block.

Periodic Table of Electronegativities