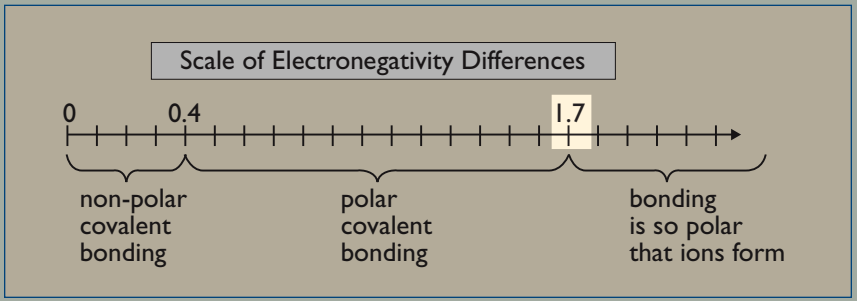
If the difference lies between 0.5 and 1.7, the bond is considered polar. The larger the difference, the more polar the bond is.



Electronegativity can also be used to predict whether a bond between two atoms will be covalent or ionic. A covalent bond is formed when the electrons in the bond are shared between the two atoms, whether equally (non-polar) or unequally (polar). When the difference between the atoms' abilities to attract electrons becomes great enough, one atom fully takes up the electrons from the bond, and the other atom loses them. This transfer of electrons results in an ionic bond because two ions form. (One ion is negative, with the additional electron, and the other ion is positive, because it now lacks an electron.) Bonds with electronegativity differences greater than 1.7 will usually be ionic.

So you can predict whether a molecule will be polar or non-polar by examining its structure. If the atoms in the molecule are connected in a way that produces one or more polar bonds, then the molecule is probably polar. (The shape of a molecule also determines whether it is polar or not, but we will ignore that for now.) If a molecule contains no polar bonds, it is non-polar.

Why "Like Dissolves Like" and Surfactants Dissolve in Both Polar and Non-polar Substances

Polar molecules are attracted to each other because the positive part of one molecule is attracted to the negative part of the next. So, in a glass of water, each water molecule is attracted to the others around it, making a very stable situation. Attraction between molecules of a substance raises its melting and boiling point. Adding a non-polar molecule like oil would disrupt this attraction, breaking the attraction/stabilization feature between water molecules. A solution in which the oil and water molecules are mixed together is therefore less stable than one in which they are separated, so oil and water don't mix. In general,