Chemical Bonding Essay, Research Paper

Chemical bonds are what make up the world. In bonds, elements are held together and form compounds that may have new physical and chemical properties. There are two main kinds of bonds, they ionic and covalent. In bonding the goal of the atoms involved is to reach a level of stability with less energy. In order to reach the epitome of stability, as in the case of noble gases, an atom strives to complete its outer shell. Either losing or gaining electrons may do this, which concludes in an ionic bond or the sharing of electrons with other atoms which makes a covalent bond.

Ionic bonds, as you can probably surmise form from ions. Ions are made when an atom gains an electron to form a negative ion or loses an electron to form a positively charged ion. As an example of an ionic bond let’s used the elements Cl and Na. First, we must understand that there is an attraction between them because one is positive and the other negative and that the Cl atom contains seven valence electrons and Na one. So, as the atoms bond the Na loses its valence electron and Cl gains it making its outer shell complete and it more stable. During this reaction light and heat are given off. This shows an exothermic reaction, which is a release of energy. The electrostatic energy between the two holds them together. Ionic bonds are useful because in a liquid state it can conduct electricity. This is possible because it contains ions. That doesn’t conduct electricity in the solid state because there is not enough room within the molecule. The substance produced by this bond is table salt. Other salts, such as CaCl (rock salt) are formed in the same way and although they have a different crystalline structure they do possess the same physical properties.

Covalent bonds, as stated earlier, are when the atoms share electrons with each other. Covalent bonds can exist in each of the phases of matter. As a covalent bond is formed energy is released, sometimes violently as in the case of nitro-triodine (2NI3).

Although covalent bond releases energy they do require a lot of energy to be broken apart. A strong example of this is the nitrogen in the atmosphere. An energy jolt as strong as that of a lighting bolt (1.21 jigawatts) is needed to separate the nitrogen and make nitric acid. The acid is then taken in by plants in order to produce amino acids and for DNA.

Chemical bonds are the building blocks of all substances. The atmosphere, the Earth, and even your own body are products of chemical bonding.