Compare and contrast different types of chemical bond

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**Introduction**

Chemical bond is the key and basic learning concept in chemistry. Chemical bond is described as lasting attraction which exist between ions, atoms or molecules that allows the formation of chemical compounds (Albert, 2014). The formation of the bond can be triggered by electrostatic force of attraction occurring between two opposite charged ions. It is claimed by some scientists that chemical bond is what hold atoms together. Most importantly, chemical bonding takes place where electrons simultaneously attracted to two nuclei. The chemical reaction which occurs between two atoms lowers the rate energy and therefore, caused the separation of atoms (Nahum, Mamlok-Naaman, Taber, & Hofstein, 2010). There are four major types of chemical bonds metallic, ionic and covalent. These bonds are formed between metallic and nonmetallic.

There are different between metallic and ionic bond. According to Gray (2012), ionic is formed from the transfer electrons from mental to a nonmetal. Covalent bond is formed from sharing of electrons between the atoms. The covenant bond is found between nonmetals. The covalent bond share electrons while ionic bond transfer electrons. In covenant bond the pair of electrons which exits in the polar covalent bonds is not equally shared. In ionic bond electrons are transferred. For example, Na (Sodium) + CI (Chlorine) = NaCI. The Chlorine (CI) is transferred and sodium lost an electron to become Na+. At the same time the Chlorine gained an electron to form CI. However, in covalent bonding the electrons are shared equally and therefore, no element lost any electron. For example, the chemical reaction which takes place between hydrogen (H) and hydrogen (H) result in sharing of the electrons and therefore, result to one chemical bond (Gray, 2012). The covalent bond has lower melting points and electrical conductivity compared to ionic compound. Studies also indicate that solid ionic compounds or bond cannot conduct electricity because they do not have free mobile electronic or ions. However, dissolved ionic compound in water is electronically conductive solution.

In contrast, the covalent bond or compounds do not indicate any properties of conducting electricity either when in pure form or when it is dissolved in water. Helmenstine (2019) pointed out that ionic compounds do exist in stable crystalline structures. This therefore, makes it to have a higher melting and boiling point compared to the compound s of covalent. In terms of the strength, the chemical bonds have different strength. According to Helmenstine (2019), the covalent bond s stronger and therefore, a lot of energy are required to break it. It would take a double energy to break the covalent bond of two oxygen of O2 compared to the hydrogen atom of H2

However, ionic bond form crystals and has got higher enthalpies of vaporization and fusion than molecular compounds. The ionic compound is hard and brittle. The ionic bonds also have high boiling and melting points and only conduct electricity when dissolved in water. The ionic bond also form crystal and have both negative and positive attraction to each other. The ionic bond or compounds are also good insulators compound to other chemical bonds. Though ionic bonds conduct electricity when dissolved in water, it is good insulators because of its binds are held so tightly together to each other. This makes them not to conduct electricity well when in solid state. A lot of energy is also required to boil the ionic bond and therefore, it is the reason it has a higher boiling and melting point.

The third type of chemical bond is known as metallic bond and therefore, its compounds are metallically held. Metallic bond is regarded as the type of chemical bond established between free electrons and positively charged atoms and shared among the lattice of cations. In contrast the ionic and covalent bonds are established or formed between two discrete atoms. As pointed in the study conducted by Petterson (2015), metallic bonding is the major type of chemical bond which is formed between metal atoms. In terms of strength, metallic bond is stronger than ionic and covalent bond. The major different among the chemical binds exist in strength and conductivity. The metallic bond are can be used for electrical conductivity. The metal bonds are shinny and display metallic luster. The metallic bond is also opaque and certain minimum of thickness. The strength of the metal is based on the attractions between the two atoms exist between metallic bonds. This gives the metallic bond a higher density, high boiling point, melting point and low volatility (Gray, 2012). For example, mercury is known mercury with high vapor pressure. It is therefore, means that all metals which are grouped under zinc are relatively volatile. It is evident metallic bond is volatile compared to ionic and covalent bond.

It is evident that ionic, covalent and metallic bond have certain similarities. The three types of chemical bonds have higher boiling and melting point. They also form crystal and conduct electricity though ionic is a poor conductor when in a solid state. They all form a chemical reaction either by losing or gaining electrons. In brief, the chemical bonds formed different reactions and form compound after reactions.

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