

Ionic and covalent bonding

[Linguistics](#), [English](#)



Ionic and covalent bonding Ionic and covalent bonding Introduction In every atom, there are two types of atomic bonding; covalent and ionic bonding. These bonds are different in terms of structure and property. Covalent bond is formed when two or more molecules share electrons, binding the two atoms in a fixed position (Atkins 2009, p. 5). In connection to these, high energy is required to break covalent bonds. Formation of a bond between two atoms will depend on their electronegativity; the ability of an atom to attract electrons towards itself. In cases where the electronegativity between two atoms differs significantly, for example, potassium and chloride, then an ionic bond is formed (Atkins 2009, p. 7). Formation of ionic bond takes place when an electron is transferred from a non metal to metal making the two atoms have partial positive and negative charge hence they attract one another.

Formation of ionic bonds

Reaction between non-metals and metals results into electrons being transferred from the metal to non-metal and, therefore, the metal and non-metal forms ions. On the other hand, the compound formed is called an ionic compound (Gaskell 2008, p. 17).

The following example shows reaction between sodium and chlorine.

In the above example, sodium atom loses an electron to the chlorine atom. Therefore, sodium atom, therefore, becomes partially positively charged while the chlorine atom becomes partially negatively charged hence an ionic bond is formed (Gaskell 2008, p. 18).

Formation of covalent bond

Formation of covalent bonds occur when Two atoms share their outmost electrons. For example, in the formation of hydrogen molecule (Engel and

Reid 2012, p. 43).

and share bonds to form (H₂) molecule

Comparison of ionic and covalent bond

Ionic bonds do not have a definite shape while covalent bonds have definite shapes that can be predicted. In addition, covalent bonds can be broken to the original atoms which made the molecule because the atoms are close to one another so as to share electrons (Engel and Reid 2012, p. 43).

While, ionic bonds are solid, covalent bonds molecules are gaseous or liquids. Compounds that have covalent bonds have a lower melting point than ionic bonds because they have weak van der Waals forces that do not require a high amount of energy. On the other hand, ionic compound has higher melting points because their bonds are stable and hence high amount of energy is required to the bonds (Atkins & Paula 2012, p. 54).

Ionic bonds also form crystalline atoms and in solution or molten state they conduct electricity and are also polar bonds. Therefore, most of them dissolve in water but are insoluble in solvents that are not polar (Silbey et al. 2004 p. 30).

Conclusion

Ionic bonds are formed between a metal and non-metal atoms. For the formation of the bond to occur, the atoms must have high difference in electron negativity and it is made when the metal atom loses an electron to the non-metal making it partially positive while the non-metal becomes partially negative. While, covalent bonds are formed between two non-metals that have similar electronegative. Therefore, for a molecule to be stable, the two atoms have to share the two electrons. The ionic and

covalent bonds are different in terms of their melting and boiling points because of the difference in strength of the bonds that form the two molecules.

References

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