OPEN ACCESS Freely available online

Organic Chemistry: Current Research

Editorial

Editorial Note on Fission of a Covalent Bond

Mohammad McGuire*

Department of Chemistry, Northwestern University, Illinois, US

EDITORIAL

Covalent bond fission, or the breaking of covalent bonds, can occur in two ways: Homolysis, also known as homolytic bond fission, is the breakdown of a homolytic link. The breaking of a covalent bond between two atoms in homolytic bond fission occurs in such a way that each atom takes one of the bonding pair of electrons. The majority of chemical reactions involve the breaking and creation of new chemical bonds. Chemical bonds, on the other hand, can be broken in a variety of ways. In addition, the way a chemical bond breaks is important in determining the overall outcome of a chemical process.

Bond fission refers to the breaking of a chemical bond (typically a covalent bond). Homolytic and heterolytic fission are the two main forms of bond fission. Covalent bond fission, or the breaking of covalent bonds, can occur in two ways:

(i) Homolysis: It is also known as homolytic bond fission, occurs when a covalent link between two atoms is broken in such a way that each atom takes one of the bonding pair of electrons. The most common method of bond fission in the vapour phase is homolytic bond fission, which occurs in the presence of heat, light, or organic peroxides. Free radicals, which are electrically neutral and have one unpaired (odd) electron, are the end products of homolysis. Due to the tendency of this electron to become coupled as soon as possible, free radicals are particularly reactive. The reactions that occur as a result of the intermediate production of free radicals are frequently quite fast.

The fission of a covalent link in which one of the shared pair's electrons is transferred to each of the bound atoms. As a result, instead of an electron pair, a single electron moves in this form of cleavage. Free radicals are produced by homolytic cleavage.

(ii) Heterolysis or heterolytic bond fission: In heterolytic bond fission, the covalent link between two atoms is broken in such a way that one of the atoms takes up both of the bonding pair of electrons. Ions are produced when the more electronegative atom takes up both bonding pairs of electrons. Heterolysis is most commonly found in polar chemicals and polar solvents. Reactions involving heterolytic fission occur at predictable rates. The shared pair of electrons remains with one of the pieces in this form of covalent bond fission. Carbocation and carboanion are produced by hetrolytic fission.

Cleavage of covalent bonds under homolytic and heterolytic conditions

When comparing the bond dissociation energies for the identical types of bonds, it can be shown that the heterolytic dissociation energy is significantly larger than the homolytic dissociation energy. When a neutral molecule is heterolyzed, two ions are produced: a positive and a negative ion. Separation of these opposing charges, on the other hand, necessitates a significant amount of energy. Bond dissociation takes a simpler path in the gas phase, namely homolysis. However, heterolysis is the preferred type of breakage in an ionising solvent. Register with BYJU'S and download the mobile application on your smartphone to learn more about homolytic and heterolytic fission.

Correspondence to: Mohammad McGuire, Department of Chemistry, Northwestern University, Illinois, US, E-mail: McGuire@illinois.edu

Received: November 06, 2021, **Accepted:** November 11, 2021, **Published:** November 16, 2021

Citation: McGuire M (2021) Editorial on Note Fission of a Covalent Bond. Organic Chem Curr Res. 11: 250.