Quadrant II – Transcript and Related Materials

Programme: F. Y. B. Sc

Subject: Chemistry

Paper Code: CHC 101

Paper Title: Inorganic and Organic Chemistry (Section B)

Unit: 1

Module Name: Cleavage of Bonds- Homolysis and Heterolysis

Module No: 06

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Notes

Organic compounds are covalent in nature. A covalent bond represents a shared pair of electrons between two atoms.

A chemical reaction involves breaking of existing bonds and formation of new bonds. Bond breaking is also called as cleavage or fission.

Consider a covalent bond between atom A and atom B.

A : B or **A – B**

Here, the cleavage of A-B bond can take place depending upon the relative electronegativities of atom A and atom B.

A covalent bond can undergo cleavage in two ways:

1. Homolytic cleavage (Homolysis):

It involves the breaking of the covalent bond in such a way that each of the two atoms joined by the bond retains one electron each. In homolytic cleavage, free radicals are formed. Homolytic reactions are usually initiated by heat, light or organic peroxides. The movement of electrons in homolytic cleavage is shown by half-barbed arrows.

2. Heterolytic cleavage (Heterolysis):

It involves an unequal breaking of the covalent bond, wherein the more electronegative

atom retains both the electrons of the broken bond. In heterolytic cleavage, ions are formed. Such reactions are most common in organic chemistry. Movement of electrons in heterolytic cleavage is shown by double-barbed arrows.