6.1: Writing Equations for Organic Reactions

Organic chemistry encompasses a very large number of compounds (many millions), and our previous discussion and illustrations have focused on their structural characteristics. Now that we can recognize these actors (compounds), we turn to the roles they are inclined to play in the scientific drama staged by the multitude of chemical reactions that define organic chemistry.

We begin by defining some basic terms that will be used frequently as this subject is elaborated.

Chemical Reaction: A transformation resulting in a change of composition, constitution and/or configuration of a compound (referred to as the reactant or substrate).

Reactant or Substrate: The organic compound undergoing change in a chemical reaction. Other compounds may also be involved, and common reactive partners (reagents) may be identified. The reactant is often (but not always) the larger and more complex molecule in the reacting system. Most (or all) of the reactant molecule is normally incorporated as part of the product molecule.

Reagent: A common partner of the reactant in many chemical reactions. It may be organic or inorganic; small or large; gas, liquid or solid. The portion of a reagent that ends up being incorporated in the product may range from all to very little or none.

Product(s) The final form taken by the major reactant(s) of a reaction.

Reaction Conditions The environmental conditions, such as temperature, pressure, catalysts & solvent, under which a reaction progresses optimally. Catalysts are substances that accelerate the rate (velocity) of a chemical reaction without themselves being consumed or appearing as part of the reaction product. Catalysts do not change equilibria positions.

Chemical reactions are commonly written as equations:	$$\text{Reactant(s)} \xrightarrow[\substack{\text{Reaction} \\ \text{Conditions}}]{\text{Reagent(s)}} \text{Product(s)}$$
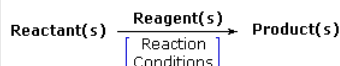
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