Chapter 7 - Alkenes: Reactions and Synthesis

Preparation of Alkenes

Alkenes are most commonly prepared by elimination reactions. Note that these are the opposite of additions reactions. For example, a halogenated alkane will undergo a dehydrohalogenation reaction in the presence of a good base. Alcohols, in the presence of a strong acid, will also undergo a stepwise elimination of water (dehydration) to produce an alkene.

Electrophilic Addition of X₂ to Alkenes

Alkenes will react with many different electrophiles. Molecular bromine, chlorine or iodine is no different. You can think of these reagents as equivalent to an X⁺ and an X⁻. Unlike the addition of HX, the halogens have the ability to share one of their lone pairs to form a bridged halonium intermediate. This is more stable than a carbocation intermediate. The result of this is that one face of a ring is blocked, so the second halide addition step can only occur trans to the first halogen. This is called an anti addition. Other nucleophiles such as water can trap the bromonium intermediate.