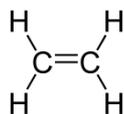


simple alkenes such as ethene undergo addition with chlorine and bromine at room temperature whereas simple alkanes such as methane react at elevated temperatures in the presence of ultraviolet light. how do you account for the difference in reactivity in terms of structure and bonding?

Solution: The chemical activity of ethane in the reactions of addition is explained by its unsaturated atoms of carbon, which are in the sp^2 -hybridization. In this case the halide atoms are like "added" to the carbon atoms to make a saturated compound. So ethane undergo **addition**. In methane atom of carbon is saturated and it takes more energy to **substitute** one of the hydrogen atoms. The energy of photon is used for homolytic break of the C-H bond to make the radical.

1. Ethene



2. Substitution of H atom in methane

