

THEORY

1. The reaction of an alkene with a halogen is an example of an electrophilic addition reaction. In this reaction, the pi electrons of the double bond attack the halogen molecule, forming a cyclic intermediate called a halonium ion. The halonium ion is then attacked by a halide ion, resulting in the formation of a vicinal dihalide.

2. The mechanism of the reaction involves the following steps:

- The pi electrons of the double bond attack one of the halogen atoms, forming a cyclic halonium ion intermediate.
- The halonium ion is then attacked by a halide ion, resulting in the formation of a vicinal dihalide.

Step	Reaction	Intermediate
1	$\text{C}_2\text{H}_4 + \text{Br}_2 \rightarrow \text{C}_2\text{H}_4\text{Br}^+\text{Br}^-$	Cyclic bromonium ion
2	$\text{C}_2\text{H}_4\text{Br}^+\text{Br}^- + \text{Br}^- \rightarrow \text{C}_2\text{H}_4\text{Br}_2$	1,2-dibromoethane

EXPERIMENT

