Transition state resembles carbocation.

**Carbocations:** Reactive intermediates of carbon which contain 6 electrons and a positive charge.

**Relative Stabilities:** $3^\circ > 2^\circ > 1^\circ$

**Structure**
4) **Reduction of Alkynes**
   
   **A) Catalytic Hydrogenation**
   
   \[
   \text{CH}_3\text{C≡C-CH}_3 + H_2 \xrightarrow{\text{Pd or Ni}} \text{CH}_3\text{C≡C-CH}_3
   \]
   
   **Cis**

   \[
   \text{H}_2 \xrightarrow{\text{Pd}} \text{CH}_3\text{C≡C-CH}_3
   \]

   **B) Lithium and Ammonia**
   
   \[
   \text{C≡C} + \text{LiNH}_2 \xrightarrow{\text{NH}_3} \text{C≡C} + 2 \text{LiNH}_2
   \]
   
   **Trans**
O) Polymerization

Mechanism

Repeat many times
Homework #7

1. What set of reagents always gives a cis alkene when reacting it with an alkyne? A trans alkene from an alkyne?

2. What set of reagents adds a Br to the more substituted carbon of the alkene? A Br to the less substituted carbon?

3. What set of reagents adds an OH to the more substituted carbon of the alkene? An OH to the less substituted carbon?

4. How many reactions of alkenes form a three-membered ring as the product? Name them.

5. What is the difference between a singlet carbene and a triplet carbene?

6. When are rearrangements possible?