

## 12.5: Activated Complex

Velcro is a synthetic material that allows fabric (among other things) to stick together. Another, more unusual, use for Velcro is the sport of "Velcro-jumping". The participant wears clothing made of Velcro and jumps at a Velcro-covered wall. Sometimes the collision with the wall will result in the person sticking to the wall. Other times, the person simply bounces off the wall and does not connect.

### Activated Complex

Reactant particles sometimes collide with one another and remain unchanged by the collision. Other times, the collision leads to the formation of products. The state of the particles that is in between the reactants and products is called the activated complex. An **activated complex** is an unstable arrangement of atoms that exists momentarily at the peak of the activation energy barrier. Because of its high energy, the activated complex exists for an extremely short period of time (about  $10^{-13}$  s). There is equal likelihood that the activated complex either reforms the original reactants or goes on to form products. The figure below shows the formation of a possible activated complex between colliding hydrogen and oxygen molecules. Because of their unstable nature and brief existence, very little is known about the exact structures of many activated complexes.

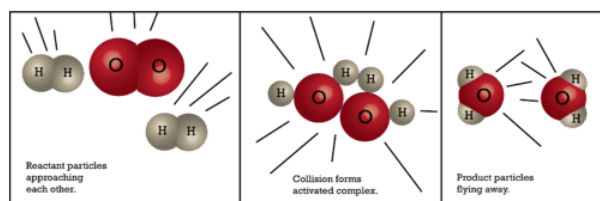


Figure 12.5.1: An activated complex is a short-lived state in which the colliding particles are at the peak of the potential energy curve. (CC BY-NC; CK-12)

### Summary

- An activated complex is an unstable arrangement of atoms that exists momentarily at the peak of the activation energy barrier.
- The role of the activated complex in reactions is described.

This page titled [12.5: Activated Complex](#) is shared under a [CK-12](#) license and was authored, remixed, and/or curated by [Theodore Chan](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.

- **18.5: Activated Complex** by [CK-12 Foundation](#) is licensed [CK-12](#). Original source: <https://flexbooks.ck12.org/cbook/ck-12-chemistry-flexbook-2.0/>.