

## 2.4 Chemical Reactions

### KEY CONCEPT

Life depends on chemical reactions.



## 2.4 Chemical Reactions

- **Bonds break and form during chemical reactions.**
  - Chemical reactions change substances into different ones by breaking and forming chemical bonds.
    - Reactants are changed during a chemical reaction.
    - Products are made by a chemical reaction.

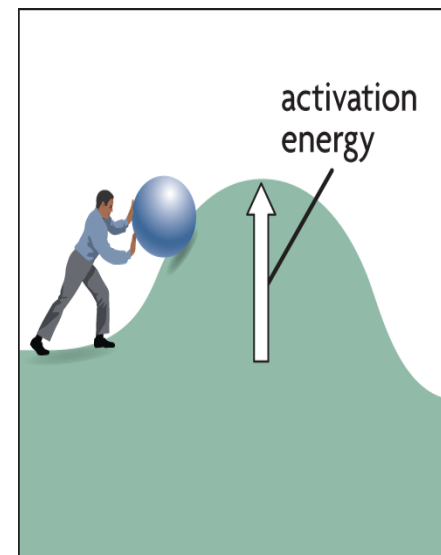
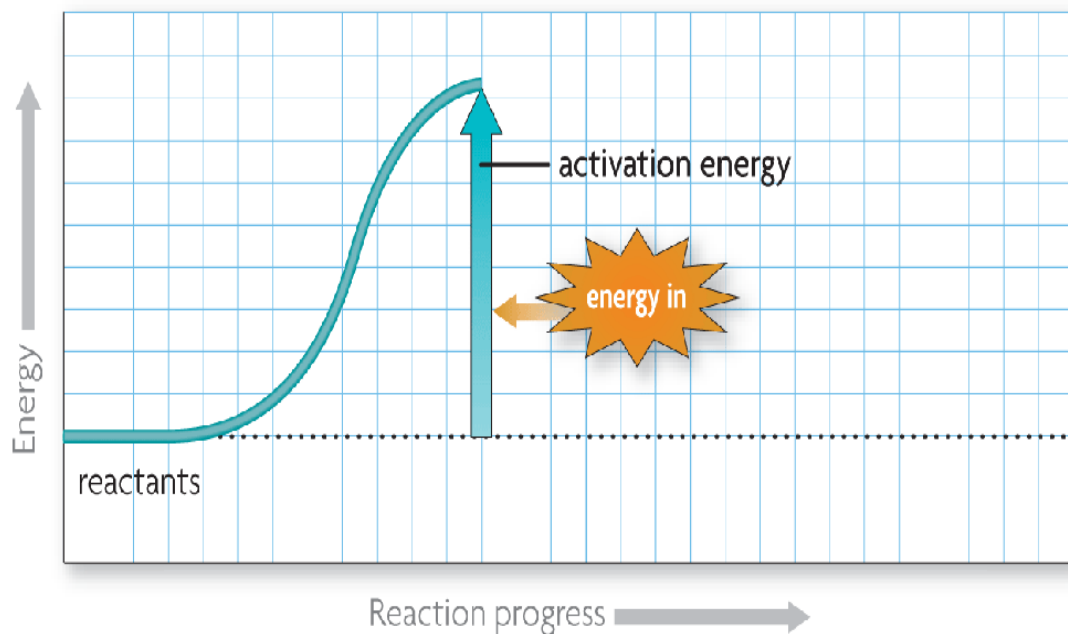
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- Bond energy is the amount of energy that breaks a bond.
  - Energy is added to break bonds.
  - Energy is released when bonds form.
- A reaction is at equilibrium when reactants and products form at the same rate.



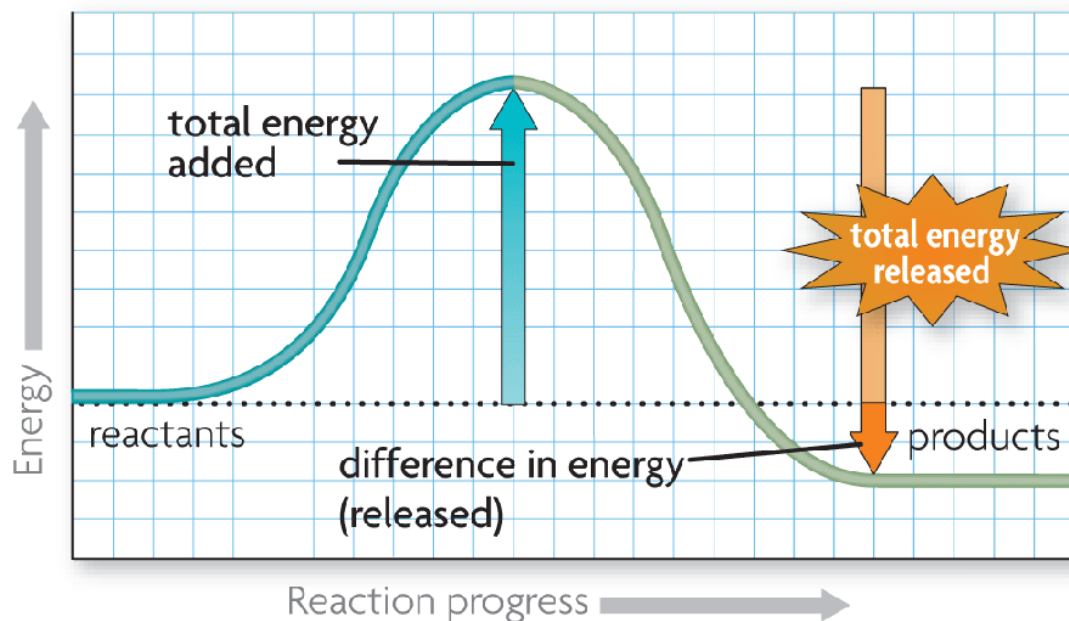
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- **Chemical reactions release or absorb energy.**
  - Activation energy is the amount of energy that needs to be absorbed to start a chemical reaction.



## 2.4 Chemical Reactions

- Exothermic reactions release more energy than they absorb.
  - Reactants have higher bond energies than products.
  - Excess energy is released by the reaction.



## 2.4 Chemical Reactions

- Endothermic reactions absorb more energy than they release.
  - Reactants have lower bond energies than products.
  - Energy is absorbed by the reaction to make up the difference.

