

Collision Theory of Chemical Reactions

1. *Who put forward the collision theory of chemical reactions?*

- a) Trautz and Lewis
- b) Luigi Galvani
- c) Henry Cavendish
- d) Alessandro Volta

Answer: Trautz and Lewis

2. *The proper orientation of reactant molecules leads to bond formation.*

- a) True
- b) False

Answer: True

3. *Which of the following is a drawback of collision theory?*

- a) Proper orientation
- b) High activation energy
- c) Hard spheres
- d) Have energy equal to or greater than the threshold energy

Answer: Hard spheres

4. *What is the term used to refer to the number of collisions per unit volume of the reaction mixture?*

- a) Collision force
- b) Collision frequency
- c) Collision energy
- d) Collision time period

Answer: Collision frequency

5. *What is the rate of reaction for a bimolecular elementary reaction?*

- a) $Z_{AB} e^{-E_a/RT}$
- b) $Z_{AB} e^{E_a/RT}$
- c) $-Z_{AB} e^{-E_a/RT}$
- d) $-Z_{AB} e^{E_a/RT}$

Answer: $Z_{AB} e^{-E_a/RT}$

6. *In a chemical reaction, if the reactant requires a high amount of activation energy, then what is the behaviour of the reaction?*

- a) Fast
- b) Slow

- c) Instantaneous
- d) Doesn't depend on activation energy

Answer: Slow

7. What are the factors that determine an effective collision?

- a) Translational collision and energy of activation
- b) Threshold energy and proper orientation
- c) Proper orientation and steric bulk of the molecule
- d) Collision frequency, threshold energy and proper orientation

Answer: Collision frequency, threshold energy and proper orientation

8. When a catalyst is involved in the collision between the reactant molecules, more energy is required.

- a) True
- b) False

Answer: False

9. Which of the following explains the increase in the reaction rate by a catalyst?

- a) Catalyst decreases the rate of backward reaction so that rate of forward reaction increases
- b) Catalyst provides extra energy to reacting molecules so that they produce effective collisions
- c) Catalyst provides an alternative path of lower activation energy to the reactants
- d) Catalyst increases the number of collisions between the reacting molecules.

Answer: Catalyst provides an alternative path of lower activation energy to the reactants

10. Effective collisions are those in which molecules must acquire the energy of activation.

- a) True
- b) False

Answer: True