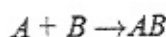


Rate of Reaction

4. Given the reaction:



The table below shows student data obtained about the rate of reaction when the concentration of solution *A* is kept constant and the concentration of solution *B* is changed by adding H_2O . Based on the data, the student should conclude that the

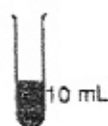
Trial	Volume of Solution A	Volume of Solution B	Volume of H_2O Added	Reaction Time
1	10 mL	10 mL	0 mL	2.8 sec
2	10 mL	5 mL	5 mL	4.9 sec
3	10 mL	3 mL	7 mL	10.4 sec

- A) concentration has no effect on the reaction rate
B) reaction rate increased when H_2O was added
C) reaction rate increased as solution *B* was diluted
D) reaction rate decreased as solution *B* was diluted
5. After being ignited in a Bunsen burner flame, a piece of magnesium ribbon burns brightly, giving off heat and light. In this situation, the Bunsen burner flame provides
- A) ionization energy
B) activation energy
C) heat of reaction
D) heat of vaporization
6. An increase in the surface area of reactants in a heterogeneous reaction will result in
- A) a decrease in the rate of the reaction
B) an increase in the rate of the reaction
C) a decrease in the heat of reaction
D) an increase in the heat of reaction
7. At $20^\circ C$, a 1.2-gram sample of Mg ribbon reacts rapidly with 10.0 milliliters of 1.0 M $HCl(aq)$. Which change in conditions would have caused the reaction to proceed more slowly?
- A) increasing the initial temperature to $25^\circ C$
B) decreasing the concentration of $HCl(aq)$ to 0.1 M
C) using 1.2 g of powdered Mg
D) using 2.4 g of Mg ribbon
8. Given the balanced equation representing a reaction:
- $$Fe(s) + 2HCl(aq) \rightarrow FeCl_2(aq) + H_2(g)$$
- This reaction occurs more quickly when powdered iron is used instead of a single piece of iron of the same mass because the powdered iron
- A) acts as a better catalyst than the single piece of iron
B) absorbs less energy than the single piece of iron
C) has a greater surface area than the single piece of iron
D) is more metallic than the single piece of iron

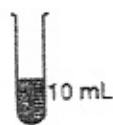
Rate of Reaction

9. Each of four test tubes contains a different concentration of HCl(aq) at 25°C . A 1-gram cube of Zn is added to each test tube. In which test tube is the reaction occurring at the fastest rate?

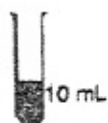
A) 1 M HCl(aq)



B) 0.1 M HCl(aq)



C) 0.01 M HCl(aq)



D) 0.001 M HCl(aq)



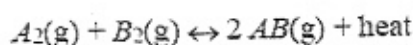
10. As the concentration of reacting particles increases, the rate of reaction generally
- A) decreases B) increases
C) remains the same
11. Which change would most likely increase the rate of a chemical reaction?
- A) decreasing a reactant's concentration
B) decreasing a reactant's surface area
C) cooling the reaction mixture
D) adding a catalyst to the reaction mixture
12. Which statement best describes how a catalyst increases the rate of a reaction?
- A) The catalyst provides an alternate reaction pathway with a higher activation energy.
B) The catalyst provides an alternate reaction pathway with a lower activation energy.
C) The catalyst provides the same reaction pathway with a higher activation energy.
D) The catalyst provides the same reaction pathway with a lower activation energy.
13. If the pressure on gaseous reactants is increased, the rate of reaction is increased because there is an increase in the
- A) activation energy B) volume
C) concentration D) heat of reaction

14. A 1.0-gram piece of zinc reacts with 5 milliliters of HCl(aq) . Which of these conditions of concentration and temperature would produce the greatest rate of reaction?

A) 1.0 M HCl(aq) at $20.^\circ\text{C}$
B) 1.0 M HCl(aq) at $40.^\circ\text{C}$
C) 2.0 M HCl(aq) at $20.^\circ\text{C}$
D) 2.0 M HCl(aq) at $40.^\circ\text{C}$

15. In a biochemical reaction, an enzyme acts as a catalyst, causing the
- A) activation energy of the reaction to decrease
B) potential energy of the reactants to decrease
C) kinetic energy of the reactants to increase
D) heat of reaction to increase

16. Given the reaction:



An increase in the concentration of $\text{A}_2(\text{g})$ will

- A) decrease the production of $\text{AB}(\text{g})$
B) decrease the frequency of collisions between $\text{A}_2(\text{g})$ and $\text{B}_2(\text{g})$
C) increase the production of $\text{B}_2(\text{g})$
D) increase the frequency of collisions between $\text{A}_2(\text{g})$ and $\text{B}_2(\text{g})$
17. A reaction is most likely to occur when reactant particles collide with
- A) proper energy, only
B) proper orientation, only
C) both proper energy and proper orientation
D) neither proper energy nor proper orientation
18. Given the reaction:
- $$\text{A} + \text{B} \rightarrow \text{C} + \text{D}$$
- The reaction will most likely occur at the greatest rate if A and B represent
- A) nonpolar molecular compounds in the solid phase
B) ionic compounds in the solid phase
C) solutions of nonpolar molecular compounds
D) solutions of ionic compounds