

1. The energy needed to initiate a chemical reaction by breaking the intramolecular bonds and pushing the two molecules together is called the _____.
- (A) equilibration energy
(B) kinetic energy
(C) elevation energy
(D) activation energy
2. Catalysts _____.
- (A) raise the kinetic energy
(B) lower the potential energy
(C) raise the activation energy
(D) lower the activation energy
3. Which chemical equation is correct?
- (A) $C_3H_8 + 3O_2 \rightarrow 5CO_2 + 4H_2O$
(B) $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 2H_2O$
(C) $C_3H_8 + 3O_2 \rightarrow 5CO_2 + 2H_2O$
(D) $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
4. Balance the following chemical equation.
 $\underline{\hspace{1cm}} FeS_2 + \underline{\hspace{1cm}} O_2 \rightarrow \underline{\hspace{1cm}} Fe_2O_2 + \underline{\hspace{1cm}} SO_2$
- (A) $4FeS_2 + 10O_2 \rightarrow 2Fe_2O_2 + 8SO_2$
(B) $2FeS_2 + 8O_2 \rightarrow 2Fe_2O_2 + 8SO_2$
(C) $4FeS_2 + 4O_2 \rightarrow 4Fe_2O_2 + 8SO_2$
(D) $2FeS_2 + 10O_2 \rightarrow Fe_2O_2 + 8SO_2$
5. In the reaction $Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$, how many moles of H_2 result when 1 mole of water reacts with calcium?.
- (A) $\frac{1}{2}$
(B) 1
(C) 2
(D) 4
6. 250 mL of a 2 M solutions contains _____.
- (A) 0.125 moles
(B) 0.25 moles
(C) 0.5 moles
(D) 1.0 mole
7. When a chemical reaction is at equilibrium, _____.
- (A) the rate of formation of products equals the rate of formation of reactants
(B) the concentration of products equals the concentration of reactants
(C) the rate of formation of products equals the equilibrium constant
(D) the equilibrium constant has reached 1.0
8. Which of the following is an exothermic process?
- (A) condensation of water
(B) melting of ice
(C) evaporation of water
(D) evaporation of ice

9. An endothermic reaction can still take place spontaneously if _____.

- (A) the products do not produce too much disorder (entropy)
- (B) the products produce enough enthalpy (heat)
- (C) the products produce enough disorder
- (D) the reactants become more disordered

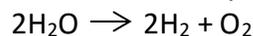
10. According to LeChatelier's principle, adding heat to a chemical reaction causes an exothermic reaction _____.

- (A) to shift to the right
- (B) to shift to the left
- (C) to shift in neither direction
- (D) to reach equilibrium faster

11. Water's phase diagram indicates that increasing the atmospheric pressure without changing the temperature makes it _____ for ice to form.

- (A) more difficult
- (B) less difficult
- (C) neither more nor less difficult

12. In the following chemical reaction, what does the equilibrium constant equal?



- (A) $K = [\text{H}_2] [\text{O}_2]/[\text{H}_2\text{O}]$
- (B) $K = [\text{H}_2\text{O}]/[\text{H}_2] [\text{O}_2]$
- (C) $K = [\text{H}_2]^2 [\text{O}_2]/[\text{H}_2\text{O}]^2$
- (D) $K = [\text{H}_2\text{O}]^2/[\text{H}_2] [\text{O}_2]$