

Unit 10 Review Quiz: Accel Chem.

- Which of the following would NOT increase the rate of a reaction?
 - Catalyst
 - Increasing the temperature
 - Increasing the surface area
 - Add more reactants
 - Add more products**
- In order for a reaction to occur...
 - Reactants must collide
 - Reactants must collide with enough energy
 - Reactants must collide in the correct orientation and have enough**
 - Reactants must collide in the correct orientation, with enough energy and be at STP
- What do you call the minimum amount of energy for a reaction to occur?
 - Activated complex
 - Reaction rate
 - Necessary energy
 - Activation energy**
- What states of matter are NOT included in the equilibrium expression?
 - Gases and aqueous
 - Gases and liquids
 - Only gases are included
 - Solids and liquids**
- What is the equilibrium constant for $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{NO}(\text{g})$?
 - $[\text{N}_2][\text{O}_2]/[\text{NO}]$
 - $[\text{NO}]^2/[\text{N}_2][\text{O}_2]$**
 - $[2\text{NO}]/[\text{N}]^2[\text{O}]^2$
 - $[2\text{NO}]/[\text{N}_2][\text{O}_2]$
- When you see a molecule in [], what kind of measurement does that represent?
 - the number of moles
 - the volume
 - the concentration, in m
 - the concentration, in M**
- Which of the following is an indication that a reaction has gone to completion?
 - the production of a gas
 - the formation of a precipitate
 - both a and b**
 - none of the above
- What is true about the forward and reverse reactions at equilibrium?
 - the forward reaction is always faster
 - the reverse reaction is always faster
 - both the forward and reverse reaction are at the same rate**
 - impossible to tell without experimentation
- What principle states that a reaction will shift to relieve a stress applied to the system?
 - 1st Law of Thermodynamics
 - 2nd Law of Thermodynamics
 - Le Chatelier's Principle**
 - Ideal Gas Law
- Given the reaction: $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g}) + \text{heat}$; what will happen to the equilibrium when you add heat?
 - the reaction will shift right
 - the reaction will shift left**
 - the equilibrium will remain unaffected
 - the reaction will proceed faster
- What stress can be applied to the following reaction to produce more $\text{O}_2(\text{g})$? $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g}) + \text{heat}$
 - add heat**
 - add $\text{SO}_2(\text{g})$
 - remove $\text{SO}_3(\text{g})$
 - add a catalyst
- The reaction has the following equilibrium concentrations: $[\text{CO}_2] = 0.755 \text{ M}$, $[\text{H}_2] = 0.875 \text{ M}$, $[\text{CO}] = 0.463 \text{ M}$. Calculate the value of the equilibrium constant. $\text{CO}_2(\text{g}) + \text{H}_2(\text{g}) \rightleftharpoons \text{CO}(\text{g}) + \text{H}_2\text{O}(\text{l})$
 - 1.06
 - 1.43
 - 0.537
 - 0.701**
- What does the value of the K_{eq} from #12 tell you about the reaction?
 - the reactants are favored**
 - the products are favored
 - neither the products nor the reactants are favored
 - a catalyst was added to the reaction

Use the energy diagram to the right to answer questions 14-16.

14. What is the activation energy for the reaction represented in the graph above?

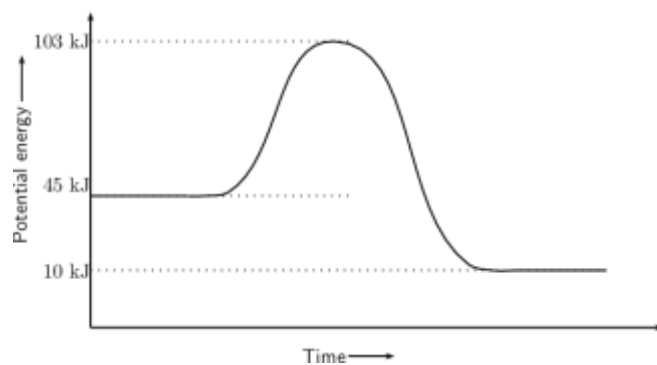
- a. 103 kJ
- b. 45 kJ
- c. 58 kJ**
- d. 10 kJ

15. Which of the following represents the energy of the reactants?

- a. 10 kJ
- b. 45 kJ**
- c. 103 kJ
- d. 55 kJ

16. What is true about the reaction represented in the figure?

- a. the reaction is endothermic
- b. the reaction is exothermic**
- c. the reactants need to gain 103 kJ of energy for the reaction to proceed
- d. there is a catalyst present in the reaction



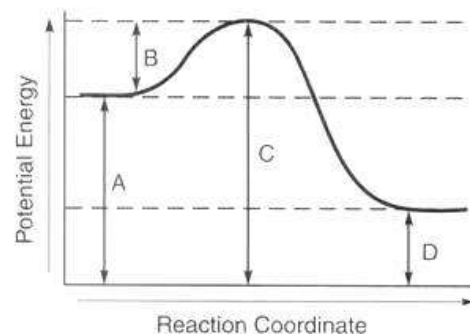
Use the graph to the right to answer questions 17-18.

17. Which letter represents the activated complex (transition state)?

- a. A
- b. B
- c. C**
- d. D

18. Which letter represents the activation energy?

- a. A
- b. B**
- c. C
- d. D



19. Which of the following describes how a catalyst increases the rate of a reaction?

- a. a catalyst shifts equilibrium to the right
- b. a catalyst shifts equilibrium to the left
- c. a catalyst lowers the activation energy required for a reaction**
- d. a catalyst participates in the reaction to speed it up and changes the products

20. A substance that has a very low K_{sp} would be..

- a. very soluble
- b. slightly soluble**

- c. would favor the reactants
- d. would favor the products

21. What is the rate law for the reaction represented in chart?

- a. rate = $k[A]^2$**
- b. rate = $[A]^2$
- c. rate = $k[A]^2[B]$
- d. rate = $k[A]^2[B]^1$

22. What is the K_{sp} for the sparingly soluble salt $Ca_3(PO_4)_2$?

- a. $K_{sp} = [Ca^{2+}]^3[PO_4^{3-}]^2$**
- b. $K_{sp} = [Ca^{2+}][PO_4^{3-}]^4$
- c. $K_{sp} = 3[Ca]2[PO_4^{3-}]$
- d. $K_{sp} = [Ca^{2+}][PO_4^{3-}]$

23. Calculate the solubility of $MgCO_3$. ($K_{sp} MgCO_3 = 6.4 \times 10^{-6}$)

- a. 2.5×10^{-3}**
- b. 5.1×10^{-3}
- c. 4.1×10^{-11}

24. Calculate the $[Ag^+]$ in a solution of Ag_2CrO_4 . ($K_{sp} = 1.1 \times 10^{-12}$)

- a. 2.1×10^{-6}
- b. 1.0×10^{-6}
- c. 6.5×10^{-5}
- d. 1.3×10^{-4}**

| Trial | Initial [A] | Initial [B] | Initial Rate mol/L*min |
|-------|-------------|-------------|------------------------|
| 1 | 0.480 M | 0.190 M | 0.350 |
| 2 | 0.480 M | 0.380 M | 0.350 |
| 3 | 0.240 M | 0.190 M | 0.087 |

- d. 8.2×10^{-11}