

Name _____

Chemistry

___/___/___

SOL Questions

Each of the following questions below appeared on an SOL Chemistry Exam between 2000 and 2003. For each of the following circle the best answer.

1. Which number on the graph to the right represents the effect of the catalyst?

- a. 1
- b. 2
- c. 3
- d. 4

2. Which number on the graph to the right represents the change in enthalpy?

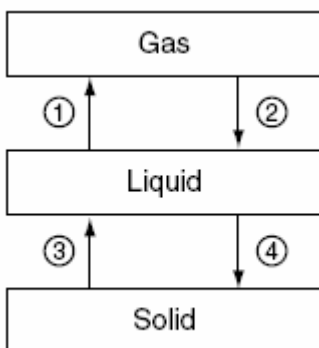
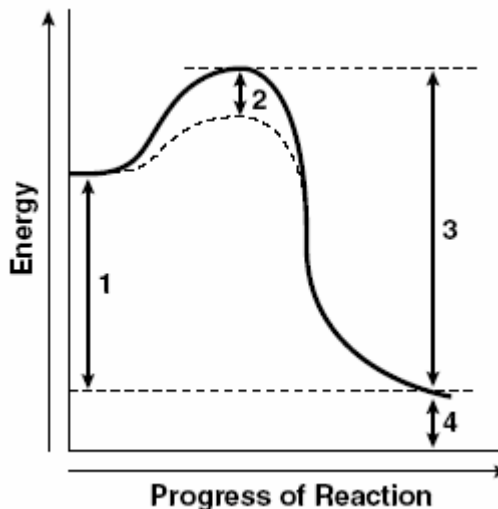
- a. 1
- b. 2
- c. 3
- d. 4

3. If the heat of fusion of water is 80 cal/gram, the amount of energy required to change 15.0 grams of ice at 0°C to 15.0 grams of water at 0°C is –

- a. 80 cal
- b. 560 cal
- c. 1200 cal
- d. 2400 cal

4. Water molecules have the greatest kinetic energy in –

- a. ice at 0°C
- b. water at 373 K
- c. water at 98°C
- d. steam at 150°C



5. Which number in the chart to the left represents condensation?

- a. 1
- b. 2
- c. 3
- d. 4

6. Which number in the chart to the left represents crystallization?

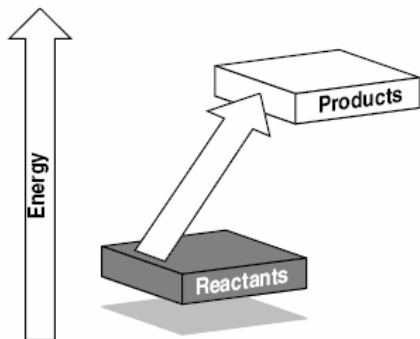
- a. 1
- b. 2
- c. 3
- d. 4

7. Which number in the chart to the left represents melting?

- a. 1
- b. 2
- c. 3
- d. 4

8. The system that shows a decrease in entropy is –

- a. air escaping from a tire
- b. snow melting
- c. salt dissolving in water
- d. water freezing



9. A catalyst is a substance used in chemical reactions to –

- a. provide a higher activation energy
- b. decrease collisions between reactant molecules
- c. increase the rate of the reaction
- d. change the equilibrium to favor products

10. The diagram to the left shows a reaction that is –

- a. reversible
- b. exothermic
- c. endothermic
- d. at equilibrium

11. The specific heat capacity of a substance is the quantity of heat required to change the temperature of 1 gram of a substance by –
- 1°C
 - 5°C
 - 10°C
 - 100°C

12. Which of the following substances in the chart to the right would be the best conductor of heat?
- aluminum
 - alcohol
 - water
 - wood

Specific Heat Capacities of Some Common Substances	
Substance	Specific Heat Capacity (cal/g °C)
Aluminum	0.21
Alcohol	0.58
Water	1.00
Wood	0.42

13. What probably causes water to have the highest specific heat of the substances listed to the right?
- molecular size
 - molecular mass
 - strong hydrogen bonds
 - high density of ice

14. A catalyst accelerates a chemical reaction because the –
- catalyst decreases the number of collisions in a reaction
 - activation energy of the reaction is lowered in the presence of a catalyst
 - catalyst decreases the concentration of the reactants
 - temperature of the reaction increases due to the catalyst

15. If the heat of fusion of water is 3.4×10^2 J/g, the amount of heat energy required to change 15.0 grams of ice at 0°C to 15.0 grams of water at 0°C is –
- 3.4×10^2 J
 - 2.4×10^3 J
 - 5.1×10^3 J
 - 1.0×10^4 J

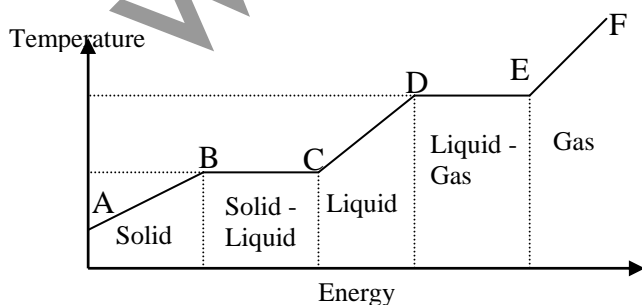
16. Which phase change involves the absorption of heat?
- gas to liquid
 - liquid to solid
 - liquid to gas
 - gas to solid

Substance	Heat of Vaporization at the Boiling Point
Water (H ₂ O)	529 calories per gram
Alcohol (CH ₃ CH ₂ OH)	204 calories per gram
Chloroform (CHCl ₃)	59 calories per gram

17. What probably causes chloroform to have the lowest heat of vaporization of the substances listed in the chart to the left?
- smallest size of the molecules listed
 - smallest mass of the molecules listed
 - smallest intermolecular forces of attraction
 - fewest number of bonds

18. Which is NOT necessary in calculating the heat of fusion for ice?
- the mass of the ice
 - the temperature change of the water and the ice
 - the heat of fusion of water
 - all are necessary

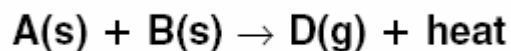
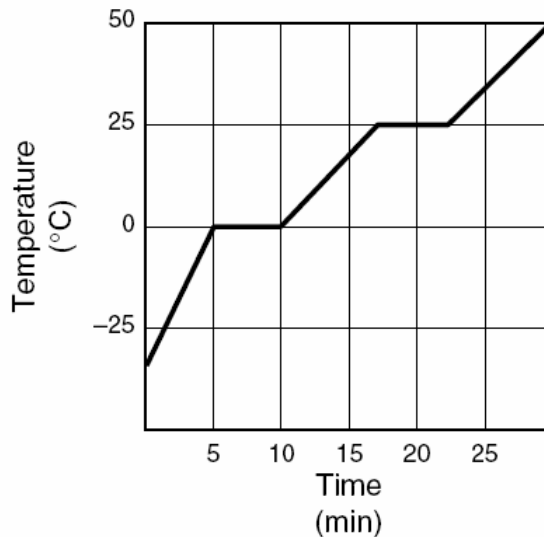
19. According to the diagram below, as energy is added to a solid, at which point does melting begin?
- A
 - B
 - C
 - D



20. According to the diagram to the left, at which point does evaporation of a gas end?
- C
 - D
 - E
 - F

21. An experiment yielded the temperature and time information shown to the right. What is the freezing point of the material in this experiment if the material is a solid at time zero?

- a. -25°C b. 0°C
 c. 25°C d. 50°C



22. The reaction shown above is —

- a. an endothermic reaction
 b. an exothermic reaction
 c. a decomposition reaction
 d. a double-replacement reaction

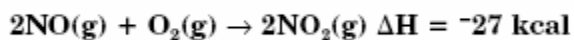
23. If the heat of fusion is 32.2 kJ/mol , the amount of heat energy required to melt 5.67 grams of FeO is —

- a. 2.54 kJ b. 3.26 kJ
 c. 5.32 kJ d. 18.3 kJ

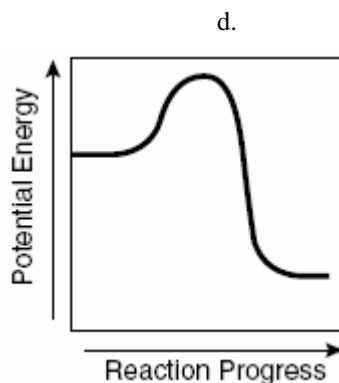
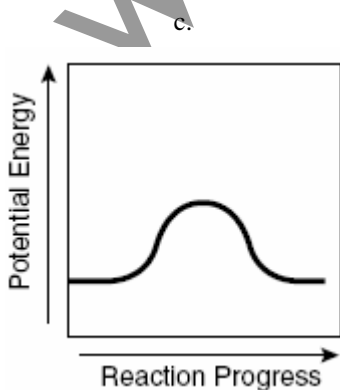
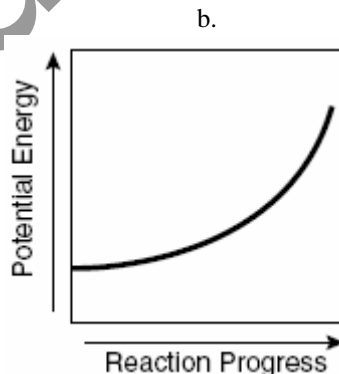
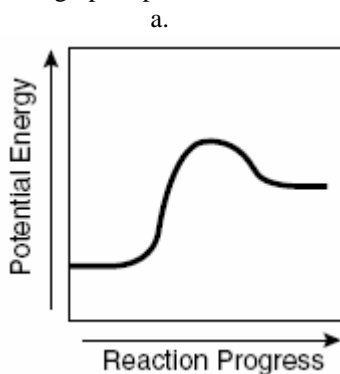
24. How many calories are required to raise the temperature of 105 g of water from 30.0°C to 70.0°C ?

- a. 1.05×10^3 b. 2.10×10^3 c. 4.20×10^3 d. 8.40×10^3

25.



Which graph represents the reaction shown to above?



26. Solid magnesium has a specific heat of $1.01 \text{ J/g}^\circ\text{C}$. How much heat is given off by a 20.0 gram sample of magnesium when it cools from 70.0°C to 50.0°C ?

a. 202 J

b. 404 J

c. 808 J

d. 1010 J

27. The energy required to melt a solid into a liquid is called —

a. heat of vaporization

b. heat of fusion

c. cooling curve

d. triple point

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