



# **Final Exam Revision** **Sheet** **Term-2** **2018-2019**

**Name:** \_\_\_\_\_

**Subject:**

**Chemistry**

**Grade:**

**11 A, B, C**

**Required Materials:**

**Chapter: 12 Section: 1, 2,3**  
**(Textbook pg. 379-402)**

**Chapter: 16 Section: 1, 2**  
**(Textbook pg. 502-520)**





Student's name: \_\_\_\_\_ "I can do it" Class/Section: 11 / \_\_\_\_

Subject: Chemistry Date: \_\_\_\_\_ NGSS: HS-PS1.A, HS-PS3.B

**Individual Work Objective:**

1. to describe the types of mixtures
2. to explain the thermochemistry

**Chemistry Revision Sheet**

**Chapter:12 Solutions**

**SHORT ANSWER**

**Q. Answer the following questions in the space provided.**

- \_\_\_\_\_ 1. Agitation prevents settling in a(n)  
a. alloy.  
b. homogeneous mixture.  
c. suspension.  
d. gaseous mixture.
- \_\_\_\_\_ 2. All of the following are heterogeneous mixtures *except*  
a. whole wheat bread.  
b. granite.  
c. tap water.  
d. an oil-water mixture.
- \_\_\_\_\_ 3. What is the concentration of a 100. mL aqueous solution that contains 1.00 g KCl (molar mass = 74.55 g/mol)?  
a. 1.34 M KCl  
b. 0.134 M KCl  
c. 0.0134 M KCl  
d. 0.001 34 M KCl
- \_\_\_\_\_ 4. To determine the molarity of an HCl solution, you need to know the number of  
a. grams of HCl in  $1 \cdot 10^6$  g of solution.  
b. moles of HCl dissolved in the total moles of solution.  
c. moles of HCl in 1 L of solution.  
d. moles of HCl dissolved in 1 kg of solvent.
- \_\_\_\_\_ 5. What type of solute-solvent combination is carbon dioxide in water?  
a. gas-liquid  
b. liquid-gas  
c. liquid-liquid  
d. cannot be determined

\_\_\_\_\_ 6. What is the molarity of a solution that contains 0.202 mol KCl (molar mass = 74.55 g/mol) in 7.98 L of solution?

- a. 0.0132 M KCl
- b. 0.0253 M KCl
- c. 0.459 M KCl
- d. 1.36 M KCl

\_\_\_\_\_ 7. Which of the following is soluble in water?

- a. potassium nitrate
- b. silver
- c. benzene
- d. carbon tetrachloride

\_\_\_\_\_ 8. In a solution at equilibrium,

- a. no dissolution occurs.
- b. the rate of dissolution is less than the rate of crystallization.
- c. the rate of dissolution is greater than the rate of crystallization.
- d. the rate of dissolution and the rate of crystallization are equal.

\_\_\_\_\_ 9. A dissolved solute that does not form ions is

- a. a nonelectrolyte.
- b. a weak electrolyte.
- c. a strong electrolyte.
- d. insoluble.

\_\_\_\_\_ 10. How many moles of HCl (molar mass = 36.46 g/mol) are present in 0.70 L of a 0.33 M HCl solution?

- a. 0.23 mol
- b. 0.28 mol
- c. 0.38 mol
- d. 0.47 mol

\_\_\_\_\_ 11. If the temperature stays the same, the solubility of gases in liquids

- a. increases with increasing pressure.
- b. cannot reach equilibrium.
- c. decreases with increasing pressure.
- d. does not depend on pressure.

\_\_\_\_\_ 12. A NaOH solution contains 1.90 mol of NaOH (molar mass = 40.00 g/mol), and its concentration is 0.555 M. What is its volume?

- a. 0.623 L
- b. 0.911 L
- c. 1.05 L
- d. 3.42 L

\_\_\_\_\_ 13. Which solution would be least likely to carry an electric current?

- a. NaCl
- b. HCl
- c. C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>
- d. CsI

\_\_\_\_\_ 14. Which type of mixture contains the smallest particles?

- a. emulsions
- b. solutions
- c. suspensions
- d. colloids

\_\_\_\_\_ 15. Which does *not* affect the rate at which a solid solute dissolves?

- a. the vapor pressure of the solvent
- b. the temperature of the solvent
- c. the surface area of the solid
- d. the speed at which the solution is stirred

\_\_\_\_\_ 16. Under which conditions is more CO<sub>2</sub> dissolved in a carbonated beverage?

- a. in a glass at room temperature
- b. in a bottle that has been left uncapped in the refrigerator
- c. in a glass with ice cubes
- d. in an unopened bottle in the refrigerator

\_\_\_\_\_ 17. What is the molality of an aqueous NaOH solution made with 5.00 kg of water and 3.6 mol NaOH (molar mass = 40.00 g/mol)?

- a. 3.6 *m* NaOH
- b. 1.4 *m* NaOH
- c. 0.72 *m* NaOH
- d. 0.090 *m* NaOH

\_\_\_\_\_ 18. How much methanol, CH<sub>3</sub>OH (molar mass = 32.05 g/mol), is needed to make a 0.90 *m* solution in 250 g of water?

- a. 0.14 g CH<sub>3</sub>OH
- b. 7.2 g CH<sub>3</sub>OH
- c. 100 g CH<sub>3</sub>OH
- d. 220 g CH<sub>3</sub>OH

**Answer the following questions in the space provided:**

19. Solid CaCl<sub>2</sub> does not conduct electricity. Explain why it is considered to be an electrolyte.

---

---

---

20. An unknown compound is observed to mix with toluene, C<sub>6</sub>H<sub>5</sub>CH<sub>3</sub>, but not with water:

a. Is the unknown compound ionic, polar covalent, or nonpolar covalent? Explain your answer.

---

---

b. Suppose the unknown compound is also a liquid. Will it be able to dissolve table salt? Explain why or why not.

---

---

---

---

**\*Problems:**

21. Consider 500. mL of a 0.30 M  $\text{CuSO}_4$  solution.

\_\_\_\_\_ a. How many moles of solute are present in this solution?

\_\_\_\_\_ b. How many grams of solute were used to prepare this solution?

22. 90. g of  $\text{CaBr}_2$  are dissolved in 900. g of water.

\_\_\_\_\_ a. What volume does the 900. g of water occupy if its density is 1.00 g/mL?

\_\_\_\_\_ b. What is the molality of this solution?

## Chapter: 16 Reaction energy

Q. write the letter of the term or phrase that best completes each statement :

\_\_\_\_\_ 1. A chemical change is likely to occur when

- a. energy and randomness both increase.
- b. energy and randomness both decrease.
- c. energy increases and randomness decreases.
- d. energy decreases and randomness increases.

\_\_\_\_\_ 2. If gas A has a higher temperature than gas B, then the particles in gas A

- a. have greater average kinetic energy than those in gas B.
- b. have less average kinetic energy than those in gas B.
- c. contain the same average kinetic energy as those in gas B.
- d. may contain more, less, or the same average kinetic energy as those in gas B.

\_\_\_\_\_ 3. An example of increasing entropy is the

- a. formation of crystals from a solution.
- b. formation of 1 mol of gas from 1 mol of one reactant gas and 1 mol of another reactant gas.
- c. dissolution of crystals in a solution.
- d. None of the above

\_\_\_\_\_ 4. The amount of energy absorbed by a system as heat during a process at constant pressure is the change in

- a. enthalpy.
- b. entropy.
- c. temperature.
- d. Gibbs free energy.

\_\_\_\_\_ 5. How much energy is needed to raise the temperature of 40.0 g of argon from 25°C to 40 °C? The specific heat capacity of argon is 0.520 J/(g·K).

- a. 20.8 J
- b. 208 J
- c. 312 J
- d. 416 J

\_\_\_\_\_ 6. An increase in temperature in a system causes a(n)

- a. increase in entropy.
- b. decrease in entropy.
- c. increase in specific heat.
- d. decrease in specific heat.

\_\_\_\_\_ 7. The change in Gibbs free energy for a substance can be found by the expression

- a.  $\Delta H - T\Delta S$ .
- b.  $\Delta H + T\Delta S$ .
- c.  $\Delta S - T\Delta H$ .
- d.  $\Delta H + T\Delta H$ .

\_\_\_\_\_ 8. A chemical reaction occurs spontaneously when  $\Delta G$  is

- a. positive.
- b. negative.
- c. zero.
- d. constant.

\_\_\_\_\_ 9. A chemical reaction is exothermic when  $\Delta H$  is

- a. positive.
- b. negative.
- c. zero.
- d. constant.

\_\_\_\_\_ 10. The term *thermodynamics* refers to the study of

- a. energy changes.
- b. only physical changes.
- c. only chemical changes.
- d. None of the above

\_\_\_\_\_ 11. What is the energy change per gram of ice when an iceberg composed of pure water,  $c_p = 2.06$  J/(g·K), is heated from -25 °C to -15 °C?

- a. 0.21 J
- b. 21 J
- c. 210 J
- d. impossible to calculate without knowing the mass of the iceberg

\_\_\_\_\_ 12. The standard enthalpy of formation of Cl<sub>2</sub> is

- a. positive.
- b. negative.
- c. zero.
- d. impossible to determine without more information.

**Use the data in the following table to answer questions (13–15):**

***Standard Enthalpies and Entropies***

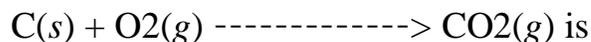
Substance	Standard enthalpy of formation (kJ/mol)	Standard entropy (J/mol)
H <sub>2</sub> (g)	0	130.7
O <sub>2</sub> (g)	0	205.1
H <sub>2</sub> O(g)	-242	188.7
CO <sub>2</sub> (g)	-393	213.8
C(s) (graphite)	0	5.7

\_\_\_\_\_ 13. For the reaction represented by the equation



- a. 242 kJ and 148.3 J.
- b. 242 kJ and -148.3 J.
- c. -242 kJ and 46.4 J.
- d. -242 kJ and -44.6 J.

\_\_\_\_\_ 14. The reaction represented by the equation



- a. spontaneous.
- b. not spontaneous.
- c. spontaneous at 298 K, but not at 25°C.
- d. impossible to determine without more information.

\_\_\_\_\_ 15. The reaction represented by the equation



- a. exothermic.
- b. endothermic.
- c. isothermic.
- d. spontaneous.

\_\_\_\_\_ 16. To determine the specific heat, you must know all of the following factors *except*

- a. mass.
- b. amount of energy needed to raise the temperature.
- c. volume.
- d. temperature change.

\_\_\_\_\_ 17. In order for an endothermic reaction to occur spontaneously, what must happen?

- a. The enthalpy must be negative.
- b. The entropy must be positive.
- c. The entropy must be negative.
- d. The change in Gibbs free energy must be positive.

\_\_\_\_\_ 18.  $\Delta H =$

- a.  $H_{\text{reactants}} + H_{\text{products}}$
- b.  $H_{\text{reactants}} - H_{\text{products}}$
- c.  $H_{\text{products}} - H_{\text{reactants}}$
- d.  $H_{\text{products}} + H_{\text{reactants}}$

\_\_\_\_\_ 19. The change in energy represented by a thermochemical equation is always

- a. equal to the number of moles of substances undergoing a change.
- b. directly proportional to the number of moles of substances undergoing a change.
- c. indirectly proportional to the number of moles of substances undergoing a change.
- d. less than the number of moles of substances undergoing a change.

\_\_\_\_\_ 20. The melting of ice is always a(n)

- a. exothermic reaction.
- b. endothermic reaction.
- c. negative entropic reaction.
- d. catalyzed reaction.

\_\_\_\_\_ 21. For a reaction that has a  $\Delta H$  of 23.0 kJ and a  $\Delta S$  of -130 J/K, what is  $\Delta G$  at 25.0°C?

- a. -15.7 kJ
- b. +15.7 kJ
- c. -61.7 kJ
- d. +61.7 kJ

**22. Answer the following questions in the space provided:**

a. Describe Hess' s law.

---

---

---

---

---

b. Describe what is meant by *enthalpy of combustion* and how a combustion calorimeter measures this enthalpy.

---

---

---

---

c. What is Gibbs free energy?

---

---

---

---

d. What do you mean by entropy?

---

---

---

---

e. Define Enthalpy Change.

---

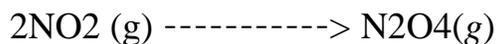
---

---

---

**Problems:**

23. Consider the following equation and data:



$$\Delta H_f^\circ \text{ of N}_2\text{O}_4 = +9.2 \text{ kJ/mol}$$

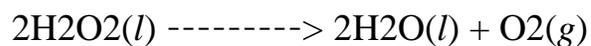
$$\Delta H_f^\circ \text{ of NO}_2 = +33.2 \text{ kJ/mol}$$

$$\Delta G = -4.7 \text{ kJ/mol N}_2\text{O}_4$$

**Use Hess' s law** to calculate  $\Delta H^\circ$  for the above reaction.

24. Calculate the energy needed to raise the temperature of 180.0 g of water from 10.0°C to 40.0°C. The specific heat of water is 4.18 J/(K · g).

25. a. Calculate the change in Gibbs free energy for the following equation at 25°C.



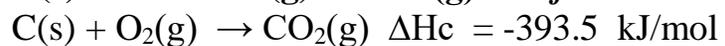
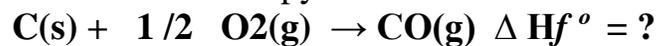
Given  $\Delta H = -196.0$  kJ/mol

$\Delta S = +125.9$  J/mol

b. Is this reaction spontaneous? \_\_\_\_\_

26. The products in a reaction have an enthalpy of 458 kJ/mol, and the reactants have an enthalpy of 658 kJ/mol. What is the value of  $\Delta H$  for this reaction?

27. Find the enthalpy of formation of following equation by using data.



Degree	Enhance &Comments	Target	Value
			<u>Tolerance</u>

Keep your school clean!

Done By: Mrs Madeeha Mubashar

