

Chem B Final Exam Review 2019

1. Identify the units for each of the following measurement types:

mass

volume

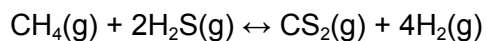
temperature

pressure

energy

molar mass

2. Use the following reaction to answer these questions based on Le Chatelier's Principle. each



$$\Delta H = -49.7 \text{ kJ}$$

How will the equilibrium shift (to the right, left, or not at all) if I add more CH_4 ?

How will the equilibrium shift if I take away H_2S ?

How will the equilibrium shift if I increase the temp?

How will the equilibrium shift if I add more H_2 ?

3. What does ΔH stand for, and what is it actually measuring?

4. Draw an enthalpy diagram that has numbers on the y axis and shows an exothermic reaction. Write out the final ΔH

5. Draw an enthalpy diagram that has numbers on the y axis and shows an endothermic reaction. Write out the final ΔH

6. Give 1 examples of a chemical reaction with $+\Delta H$ and one with $-\Delta H$ (look back in your notes or past assignments)

7. Convert 2.95 moles of CO_2 into grams of carbon dioxide. 130.g

8. If I have 55 grams of Iron (II) Oxide, how many moles would I have? .76moles

9. How many grams are present in 8.35 moles of Magnesium Carbonate? 701grams

10. 3.17 grams of Oxygen gas would be how many moles? .0991moles

For questions 11-13, please use the following equation: $4\text{Fe} + 3\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3$

11. How many **grams** of iron (Fe) are used up when 25.7 grams of iron (III) oxide(Fe_2O_3) are produced? 18.0g

12. If 88 grams of O_2 are used, how many **grams** of iron (Fe) are used? 210g

13. If I had 36 grams of iron reacting with 28 grams of oxygen gas, how many **grams** of iron(III) oxide would be produced? Which reactant is the limiting reactant? 51g or 93g, iron is the limiting reactant 51g of product

14. When 1.0 mole of propane (C_3H_8) is burned at a constant pressure, 2221 kJ of energy is released as heat. Calculate ΔH for a process in which 24.3 g of propane is burned at constant pressure. $-1226.60\text{kJ} \rightarrow -1200\text{kJ}$

15. How is molar volume different from molar mass?

16. What are the parts of the kinetic molecular theory.

17. Find the percent composition by mass of water.

11.1% and 88.9%

_____H

_____O

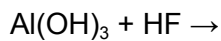
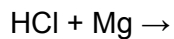
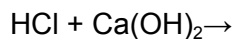
18. Explain the difference between a dilute solution and an unsaturated solution.

19. Explain the difference between a concentrated solution and a supersaturated solution.

20. What are the reactants of neutralization reactions? What are the products?

21. How does pH change when an acid is mixed with water? Why?

22. Predict the products formed by each reaction and balance the equation:



23. Review all vocab words and past test reviews from this trimester

24. How much heat is evolved if 24.00 g of methanol (CH_3OH) is burned in excess O_2 ? -544.9kJ

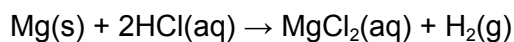
The reaction is $2 \text{CH}_3\text{OH}(\text{l}) + 3 \text{O}_2(\text{g}) \rightarrow 2 \text{CO}_2(\text{g}) + 4 \text{H}_2\text{O}(\text{g})$ $\Delta H = -1453 \text{ kJ}$

25. 5 g of methane (CH_4) has a pressure of 1.34 atm at 120°C . Find the volume occupied by the gas. 8L

26. A sample of helium gas occupies 1.4 L at 29°C and 2.956 atm. What volume will it occupy at 42°C and 2.24atm? 1.9L

27. If you have 12.3 grams of $N_{2(g)}$ at STP, then what is the size of your container holding this gas? 9.84L

28. What is the pressure in atmospheres of a container of gas at 238 KPa? 2.35atm



29. You perform the experiment above at STP and when the reaction is finished you end up with 2.8L of 4.6M $MgCl_2$.

a. How much H_2 gas in liters must have been produced? 290L

b. How much Mg metal must you have started with in grams? 310g

30. What volume of 2.45 M HF would be needed to neutralize 75.8 mL of 1.37 M LiOH? 42.4ml

31. Determine the pH and pOH of all of the following:

A. 0.000501 M HCl

pH: _____ pOH: _____

B. 4.9 M NaOH

pH: _____ pOH: _____

C. 0.0051 M KOH

pH: _____ pOH: _____

D. 0.011 M HNO_3

pH: _____ pOH: _____

(3.30,10.70; 14.69,-.69; 11.71,2.29; 1.96,12.04)

32. What is the molarity of a 2.25 L solution containing 25 g of LiBr? .13M

33. Determine the mass of the solute in a 8.04 L sample of 1.51 M solution of sucrose and water. Sucrose is $C_{12}H_{22}O_{11}$. 4150g

34. If you have solution labeled as 0.53M $NaNO_3$ and you know it contains 23 grams of solute, then what is the volume of this solution? 0.51L

35. You are preparing a lab for Chemistry class in which you need to create two samples of HCl. The first sample, A, should be 230 mL of 0.5 M HCl. The second sample, Q, should be 110 mL of 4.5 M HCl. Starting with 12 M HCl, find out how much concentrated HCl you would need for each sample. 10ml and 41ml