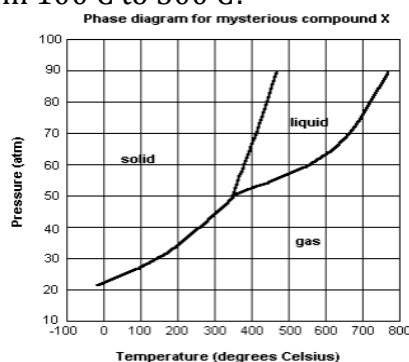


A Few Final Review Questions

1. How many significant figures are in .0020020 meters? 5
2. What is the product of density and volume? mass
3. What is the formula for percent error? $(| \text{known} - \text{experimental} | / \text{known}) \times 100$
4. Do a google search for "volumetric flask." Volumetric flasks are used to measure a precise amount of liquid, but ONLY ONE precise amount. For example, a 250 ml volumetric flask only measures 250 ml.
5. What conditions of temperature and pressure make molecules get close together?
High pressure and low temperature.

6. Review a phase diagram.... When the pressure is 40 atm, what change occurs when the temp. changes from 100 C to 500 C?
SUBLIMATION



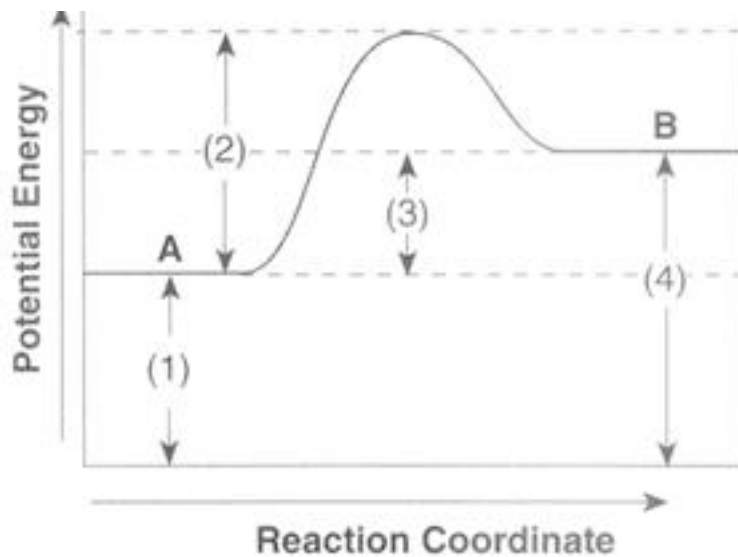
7. What is the mass of 1.204×10^{24} molecules of water? 36 grams
8. How many moles are in 400 grams of calcium carbonate? 4
9. How many grams are in 5 moles of potassium oxide? 470 grams
10. When naming compounds, when should you use Roman Numerals? When the cation has multiple oxidation state possibilities.
11. 2 liters of gas at 27 C and 200 mm Hg would change its volume to ? liters at 127 C and 400 mm Hg?
1.33 liters
12. What is the volume of 32 grams of methane at 2 atm. pressure and 27 C? 24.6 liters
13. Which diffuses faster---oxygen or ammonia? Ammonia. It is lighter.
14. The empirical formula of glucose is CH_2O . It has a molecular weight of 180. What is the molecular formula? $\text{C}_6\text{H}_{12}\text{O}_6$
15. How many joules of heat are absorbed when 100 grams of water move from 10 to 20 C? 4180 J

16. When 3 moles of sodium are mixed with 3 moles of oxygen to make sodium oxide, what limits the reaction? The sodium.

17. How does the addition of a catalyst affect activation energy?
LOWERS IT

18. What is the sign of ΔH for the forward reaction?. Negative. The reaction is endothermic
For the reverse reaction? Positive. If you move from right to left the reaction is exothermic.

Which arrow represents ΔH ? Arrow 3.



19. What is the percentage of oxygen in water? 89 % (16 / 18)

20. Equilibrium constants are constant unless what changes? Temperature.

21. Raising the temperature on an endothermic reaction will cause the equilibrium to shift in what direction? To the right.

22. Where are the most active non-metals on the periodic table? Upper right
The most active metals? Lower left

23. How does atomic radius vary with increasing atomic number within a family? increases

Electronegativity? decreases

Ionization energy? decreases

24. How many electrons are in the d sublevel of iron? 6

25. Which of the following has both ionic and covalent bonding? Copper(II) sulfate, water, or sodium chloride? Copper (II) sulfate

26. What is the geometry of carbon disulfide? linear
27. Which of the following is most soluble in water? Ammonia or carbon tetrachloride? Ammonia. It is polar
28. In what sublevel block is the last electron in lead? p
29. How many bonds do you expect to find on a carbon atom in an organic compound? 4
30. What are the ingredients used to make a buffer solution? A weak acid and a salt of the acid. (a salt with the same anion as that in the acid.)
31. What can be done to increase the solubility of gas in water and keep your soda from going flat? Lower temperature and increase pressure.
32. What is the K_a of a weak acid HA when a .2 M solution has a hydronium ion concentration of .00005?
 1.3×10^{-8}
33. What is the oxidation number of sulfur in a sulfate ion? 6
34. What is the pH of a .0001 M solution of NaOH? 10
35. A student who weighs 100 lbs steps on 5 different scales that record her weight as 80.0, 80.2, 79.3, 80.4 and 79.9 lbs. Are the scales accurate, precise, or both? Precise but not accurate
36. True or False.....when diluting, add acid to water. True. Do what you "oughter"...add acid to water
37. Boiling occurs when the molecules push on each other (vapor pressure) as hard as the _____ pushes on the surface of the liquid. ATMOSPHERE
38. What is the definition of temperature? AVERAGE KINETIC ENERGY.
39. How many grams of iron are in 50 grams of FeO? 38.9 grams $(56/70) \times 50$
40. How many oxygen atoms are in 1 mole of copper(II) sulfate pentahydrate? 9
41. The total pressure of a mixture of gases is equal to the _____. SUM OF THE PARTIAL (INDIVIDUAL) GAS PRESSURES
42. How many moles of ions are in 4 moles of calcium chloride? 12
42. A 5 gram sample of a compound of sulfur and fluorine contains 1.1 g of sulfur. What is the empirical formula of the compound? .034 moles of S and .21 moles of F. so.....**SF₆**
43. For a chemical reaction, what is the equation for ΔH ? heat of formation of products – heat of formation of reactants.
44. Are solids and liquids included in the equilibrium constant expression? NO

45. In an equilibrium reaction of gases, when pressure is decreased which way will the equilibrium shift?
Toward the side with more volume.
46. How many unpaired electrons are in a normal atom of P? 3
47. Allotrope is a word meaning different forms of the same element. i.e. diamond and graphite are allotropes of carbon. Is an alkene an allotrope of carbon? No. an alkene also contains hydrogen.
48. Do "hydrogen bonds" exist within, or between molecules? BETWEEN
49. Half life is the amount of time required for half of a radioactive substance to decay. If the half life of a substance is 20 minutes, how much of a 100 gram sample will remain after one hour? 12.5 grams.
50. Which of the following is an acid?
CH₃OH CH₃O THIS ONE → CH₃COOH
51. What chloride salts are insoluble? SILVER CHLORIDE and Mercury(I) chloride and Lead chlorides
53. How many moles are in .15 liters of .285 M ammonia? .043 moles
54. **Molality** (not molarity) is defined as moles of solute per kg of solvent. What is the molality of a solution containing 20 grams of NaOH in 500 grams of water? **1 molal** **.5 / .5**
55. Insoluble compounds actually dissolve slightly in water. When they do, the equilibrium expression is based on the PRODUCTS only. If the concentration of X in some insoluble salt ZX is .00025 M, what is the K_{sp}? 6.25×10^{-8} (.00025 squared)
56. Is the hydronium ion concentration high or low when the pH is 1? HIGH
57. When something is oxidized, does its charge go up or does it go down? CHARGE GOES UP as ELECTRONS are lost.