

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

## Basic Chemistry Study Guide

### First Semester 2009

1. What are the three parts of an atom?

Name	Location	Relative Charge
a. Proton		
b. Neutron		
c. Electron		

- Like charges \_\_\_\_\_

- Opposite charges \_\_\_\_\_

2. Atomic number = number of \_\_\_\_\_.

- a. Find the atomic numbers of

i. Carbon = \_\_\_\_\_

ii. Lead = \_\_\_\_\_

iii. Hydrogen = \_\_\_\_\_

iv. Calcium = \_\_\_\_\_

3. If Carbon has 6 protons, how many electrons does it need to be

a. Neutral = \_\_\_\_\_.

b. With a +1 charge = \_\_\_\_\_.

c. With a -1 charge = \_\_\_\_\_.

d. With a +3 charge = \_\_\_\_\_.

e. With a -4 charge = \_\_\_\_\_.

4. Identify the following as compounds or elements.

Name/Symbol	Compound/Element
H <sub>2</sub> O	
Oxygen	
Air	
C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>	
Fe	

5. Which particle in a nitrogen atom must remain the same in order for it to remain a nitrogen atom?

\_\_\_\_\_.

6. Fill in the following table:

Scale	Boiling Point	Freezing Point
Fahrenheit (°F)		
Celsius (°C)		

7. What is the difference between an ion & an atom?

8. Draw a picture of a polar water molecule showing the partial positive and partial negative charge.

a. What is the charge of a polar molecule?

b. What letter most depicts the shape of the water molecule?

9. Fill in the following table:

Solvents or Solutes	Polar or Nonpolar	Dissolves in Water or Oil
Water		
Hexane		
Sodium Chloride		
Sugar		
Kool-aid		
Oil		

10. What is the general rule for solubility that describes how these can dissolve?

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11. Define the following

a. Physical Property- \_\_\_\_\_

\_\_\_\_\_

b. Chemical Property- \_\_\_\_\_

\_\_\_\_\_

c. Physical Change- \_\_\_\_\_

\_\_\_\_\_

d. Chemical Change- \_\_\_\_\_

\_\_\_\_\_

Property	Physical or Chemical
Freezing Point	
Reaction with acid	
Color	
Formation of a precipitate	
Density	
Change in Energy (heat, light, sound)	
Solubility	

12. What is the formula for density?

13. What is a derived unit for density?

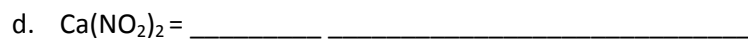
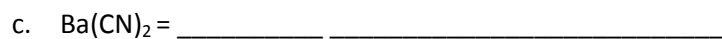
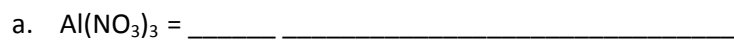
14. The density of distilled water is 1 g/ml, what would be the mass of one ml of water?

15. What is the density of a block of iron that has a mass of 15.4 grams and a volume of 2.1 ml?

16. List the three phases of matter in ascending order of density. (Least to most)

17. What's the purpose of a control in an experiment?

18. Total the number of atoms in each chemical formula:



19. People not located near a lake or river, get their water from where?

20. In municipally treated water, what is added to kill bacteria? What is added to prevent tooth decay?

21. What is the pH of an

a. Acid \_\_\_\_\_

b. Base \_\_\_\_\_

c. Neutral Substance \_\_\_\_\_

22. Match the following to acid, base or neutral

Substance	Acid, Base or Neutral	pH
Lemon Juice		
Acid Rain		
Tomato		
Drain Cleaner		
Pure Water		
Laundry Detergent		

a. Which of these from the table is the strongest

i. Acid \_\_\_\_\_

ii. Base \_\_\_\_\_

23. Which ion concentration is associated with an

a. Acid = \_\_\_\_\_

b. Base = \_\_\_\_\_

24. Define the three types of solutions and circle where it would be found on the graph:

a. Saturated- \_\_\_\_\_

\_\_\_\_\_ Circle Above, Below, on the Line

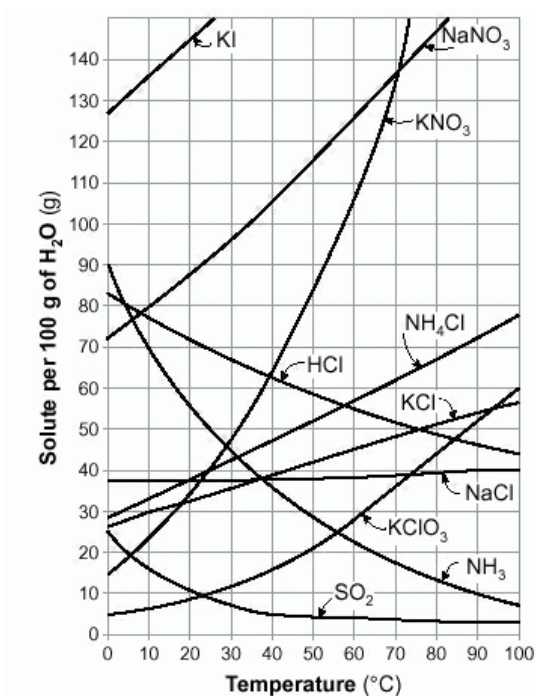
b. Supersaturated- \_\_\_\_\_

\_\_\_\_\_ Circle Above, Below, on the Line

c. Unsaturated- \_\_\_\_\_

\_\_\_\_\_ Circle Above, Below, on the Line

25. Use the graph to answer the following questions:



a. What is the solubility of Potassium Nitrate at 60°C?

b. What is the solubility of sodium chloride at 90°C?

c. How many grams of Potassium Chlorate, KClO<sub>3</sub>, would you need to have a saturated solution in 134g of water at 70°C?

d. How many grams of water would you need to dissolve 34g of Sodium Chloride, NaCl at 90°C?

e. At what temperature will 130 g of KNO<sub>3</sub> dissolve in 100 grams of water to produce a saturated solution?

26. In a solution of salt and water, which one is the solute and the solvent?

27. What's the goal of municipal water treatment?

32. Convert the following:

a. 1000 grams = \_\_\_\_\_ milligrams

b. 92.5 centimeters = \_\_\_\_\_ meters

c. 9.25 m = \_\_\_\_\_ km

28. Find the density of the following

a. A 100-g sample of balsa wood occupies a volume of  $333\text{cm}^3$ . What is the density of balsa wood?

b. A  $5.00\text{-cm}^3$  sample of mercury has a mass of 68.0 grams. What is the density of mercury?

c. Gold has gas density of  $19.3\text{ g/cm}^3$ . What is the mass of  $70.0\text{ cm}^3$  of gold?

Fill in the table :

Element Symbol	Atomic #	Atomic Mass	# protons	# electrons	# neutrons
	6			6	6
			6	6	7
Ca	20				21
			78		117
U					146

29. The rows on a periodic table are called \_\_\_\_\_

30. The columns on the on the periodic table are called \_\_\_\_\_

31. The three categories of the periodic table are \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
a. Give an example of each

32. Where are they located on the periodic table? \_\_\_\_\_

33. List two properties of a metal:

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34. List two properties of a non metal:

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35. Active metals are located where on the periodic table? \_\_\_\_\_

36. What is an alloy? \_\_\_\_\_

37. What is recycling? Why do we recycle?

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38. What is the process called turning ore to metal?

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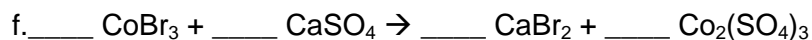
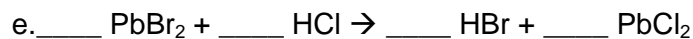
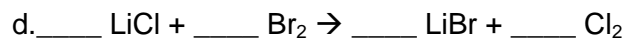
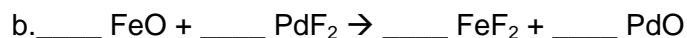
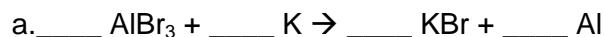
39. Low grade ore is less desirable, Why? \_\_\_\_\_

40. Thin films protect surfaces from what element in the air? \_\_\_\_\_

41. What is the same on the both sides of a balanced equation? \_\_\_\_\_

42. What are the four indications of chemical change? \_\_\_\_\_  
\_\_\_\_\_

43. Balance the following equations:



44. Pennies minted prior to 1982 were composed chiefly of what metal?

45. Using the activity series table which is more reactive Zinc or Lithium?

46. Using the activity series table which is more reactive Fe or Mn?
47. Are the properties of an alloy: similar to the base metals, completely different from the base metals (circle one)
48. How many electrons are in the following elements?
- a. As \_\_\_\_\_
  - b. I \_\_\_\_\_
  - c. Ne \_\_\_\_\_
49. How neutrons are in the following elements
- a. Cl \_\_\_\_\_
  - b. Argon \_\_\_\_\_
  - c. Na \_\_\_\_\_
50. What is a group in the periodic table? \_\_\_\_\_
51. As you go up a group what happens to the reactivity of the atom \_\_\_\_\_
52. List the following from most reactive to least reactive, Na, Rb, Cs, Li, H
53. List if the following properties are typically metals or non-metals?
- a. Shiny \_\_\_\_\_
  - b. Brittle \_\_\_\_\_
  - c. Conduct electricity \_\_\_\_\_
54. List 2 examples of liquid solutions.
- a. \_\_\_\_\_
  - b. \_\_\_\_\_

55. List 2 examples of solid solutions

a. \_\_\_\_\_

b. \_\_\_\_\_

56. Match the following as reclamation, recycling, reduction, oxidation or reusing

a. Refilling water bottle \_\_\_\_\_

b. Treating sewer water so it can go back into lakes and rivers \_\_\_\_\_

c. Turning rust (iron oxide) back into useful iron \_\_\_\_\_

d. Making new aluminum cans out of old aluminum cans \_\_\_\_\_

e. Iron rusting \_\_\_\_\_

57. The in a reaction that has reduction \_\_\_\_\_ must also always take place.

58. Name three gasses that normally never react with other elements.

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

59. Name two uses for noble gases besides filling balloons with helium.

a. \_\_\_\_\_

b. \_\_\_\_\_

60. Label the following as chemical or physical changes

a. Mixing a yellow and red solution makes a green solution \_\_\_\_\_

b. Mixing a yellow and red solution makes an orange solution \_\_\_\_\_

c. Mixing solutions makes the solution really cold \_\_\_\_\_

d. Mixing solutions makes the solution really hot \_\_\_\_\_

e. Salt dissolves in water \_\_\_\_\_

f. Gas bubbles are formed \_\_\_\_\_

g. Formation of a precipitate \_\_\_\_\_

61. Label the following as chemical or physical properties

a. Burns really hot \_\_\_\_\_

b. Shiny \_\_\_\_\_

c. Dissolves metals \_\_\_\_\_

62. Which of the following allotropes

a. Carbons dioxide and graphite \_\_\_\_\_

b. Diamonds and graphite \_\_\_\_\_

c. Ice and liquid water \_\_\_\_\_

d. White and red phosphorus \_\_\_\_\_

63. Label the following as renewable and nonrenewable

a. Wood \_\_\_\_\_

b. Oil \_\_\_\_\_

c. Iron \_\_\_\_\_

d. Pork Chops \_\_\_\_\_