IPC FINAL REVIEW SPRING 2012 KEY

Name: **Date:**

CH 2 MATTER

1. What is matter? _a substance that has mass and take ups space_____

2.

3. What are the following phase changes called?

   a. solid to liquid __melting_____
   b. solid to gas __sublimation_____
   c. liquid to gas __evaporation_____
   d. gas to liquid __condensation_____
   e. liquid to solid __freezing_____

4. What is the difference between a pure substance and a mixture? Give an example of each.

   Pure substance: __any matter that has a fixed composition and definite properties___
   _____ **EX:** __Hg, CO_2, H_2O, He_____

   Mixture: _a combination of more than one pure subtance_____
   _____ **EX:** _tossed salad, beans and rice, air

5. What is the difference between an element and a compound? Give an example of each.

   Element: __a substance that cannot be broken down into simpler substances_____
   _____ **EX:** ___Hg, He, Mg, Ca_____

   Compound: ___a substance made of atoms of more than one element bound together_____
   _____ **EX:** __ CO_2, H_2O _____

6. A man has a 50 mL bottle filled with 163 g of a slimy green liquid. What is the density of the liquid?
   163g/50 mL = 3.26 g/mL

7. A piece of metal has a volume of 6.7 cm^3 and a mass of 75.7 g. What is its density?
   WORK: 75.7 g/6.7 cc = 11.3 g/cc _____

8. The density of pine (wood) is 0.5 g/cm^3. Will pine sink or float in water?
   WORK: **pine density = .5 g/cc water density = 1.0 g/cc** _____; it will sink / float
   What is the mass of an 800 cm^3 piece of pine? ***WORK:*** .05 g/cc = ? g/ 800 cc = 400 g _____

9. Diamonds have a density of 3.5 g/cm^3. How big is a diamond that has a mass of 0.10 g?
   WORK: 3.5 g/cc = .10 g / V V = .10g/3.5 g/cc V = .02857 cc _____
   You have 25 g of steel (density = 7.8 g/cm^3) and 18 g of lead (density = 11.3 g/cm^3). Which metal has a greater volume? ***WORK:*** steel: 7.8 g/cc = 25 g/V V = 3.205 cc lead: 11.3 g/cc = 18 g/V V= 1.59 cc

10. Define physical property and chemical property and give an example of each.
    physical property: _characteristic of a substance that can be observed or measured without changing the composition of the substance._____ **EX:** __Yellow, powder_____
    chemical property: __the way a substance reacts with others to form new substances with different propeties_____ **EX:** ____iron rusts when in the air_____

11 .

CH 3 ATOMS / PERIODIC TABLE

12. The order of elements in the periodic table is based on the number of __protons_____ in the nucleus.

13. __metals_____ are elements that can conduct heat and electricity under certain conditions.

14. Dalton's atomic theory stated that

a. atoms of the same element are exactly (alike / different), and

b. atoms can join to form (atoms / compounds).

15. Sodium is an example of an (element / compound / mixture).

16. Oxygen has an atomic number of _8___. This means that an oxygen atom has _8___ protons in the nucleus.

17. The charge of an electron is negative. The charge of a proton is positve. The charge of a neutron is neutral_.

18. The outermost energy level of Group __8A ___, or 18_(noble gases), is full.

19. According to _Bohr_'s model of the atom, electrons behave like planet's orbiting the sun.

20. The _nucleus_____ is the center of the atom & is made of protons & neutrons and has a _positive_____ charge.

Group 1 (alkali)_____ metals are extremely reactive, because they have one valence electron that is easily removed to form a _1+ / 2+ / 3+_ ion.

21. Carbon and other non-metals are found on the right_ side of the periodic table.

22. The total of _protons_____ and _neutrons_____ is an atoms' mass number.

23. Atoms have no electric charge, because they have an equal number of _protons_ and _neutrons_____.

24. A lithium ion is much __less / more__ reactive than a lithium atom, because it has a full outermost energy level.

25.

26. Atoms of an element that have the same atomic number but different atomic masses are _isotopes_____.

27.

28.

29. .

30.

31.

32.

33.

34. Valence electrons / neutrons / protons determine an atom's chemical properties.

35. Atoms of elements that are in the same period / group have the same number of valence electrons.

36. _ionization_____ refers to the process of losing or gaining electrons.

Write "**I**" if the statement is characteristic of an **ionic** bond; "**C**" if the statement is characteristic of a **covalent** bond; or "**M**" if the statement is characteristic of a **metallic** bond.

__C___ 45. Bond between a nonmetal and a nonmetal.

__I___ 46. Strongest bond because of the network structure.

__I___ 47. This bond creates compounds we refer to as "salts." (think NaCl)

__M___ 48. This bond is formed by the attraction between one atom's + nucleus and its neighbor's electrons.

__C___ 49. Compounds with these bonds are not conductive unless melted or dissolved.

__I___ 50. Bond between a metal and a nonmetal.

__C___ 51. Bond formed when atoms share one or more pairs of electrons.

__M___ 52. This bond allows electrons to jump from atom to atom, which makes them conductive as solids.

Ionic Compounds

What **ions** will the following atoms form? Ex: O O^{-2}.

53. N _N^{-3}___ 54. Na _Na^{+1}____ 55. Cl _Cl^{-1}____ 56. Mg _Mg^{+2}____

Use the criss-cross method to **write the formulas** of the compounds created between the 2 ions. Then use the naming rules to **name the compound** (no prefixes!).

			Formula	Name
57.	K^{+1}	P^{-3}	___K_3P_____	__Potassium phosphide_____
58.	Al^{+3}	S^{-2}	___Al_2S_3_____	__Aluminum sulfide_____
59.	Be^{+2}	N^{-3}	___Be_3N_2_____	__Berylium nitride_____
60.	Ca^{+2}	F^{-1}	___CaF_2_____	__Calcium fluoride_____
61.				
62.				
63.				
64.				

65. Define **heterogeneous mixture**: ____mixture that is not the same throughout____

_____

66. List three examples of heterogeneous mixtures. ___fruit salad, dirt. Orange juice with pulp, vegetable soup_____

37. Define **immiscible**. __two or more liquids that do not mix into each other_____

_____

38. Give an example of an immiscible mixture. ____oil and water_____

39. Homogeneous mixtures are/ are not (circle one) uniform.

40. List three examples of homogeneous mixtures. __salt water, sugar water, tomato soup__

41. _solutions_____ are homogenous mixtures.

42. Define **solution**. __homogenous mixture of two or more ubstances uniformly spread throughout a single phase

_____

43. Define **solute**. __the substance that dissolves in a solution_____

_____

44. Define **solvent**. __the substance that dissolves the solute to make a solution_____

_____

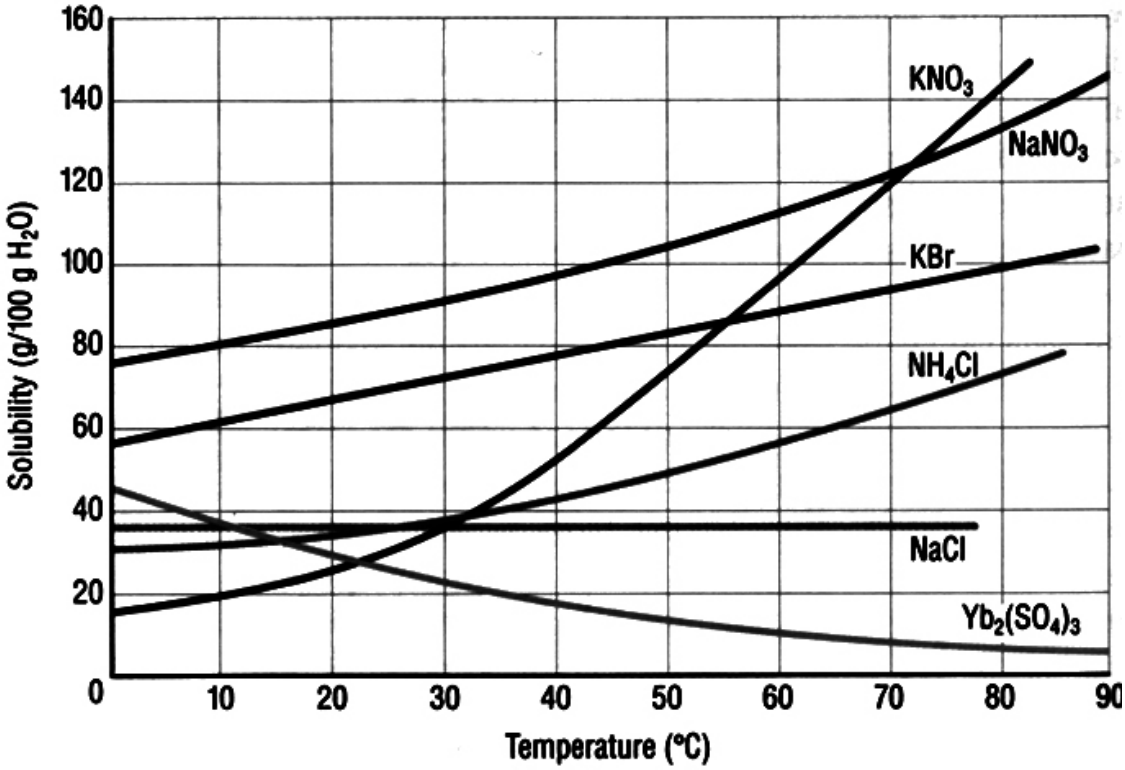
45. _miscible_____ liquids mix to form solutions.

46. Define **miscible**. _____

_____

1. Water is sometimes called the __universal_____ solvent because so many things can be dissolved in water.
2. The _structure__ of water helps it dissolve charged particles.
3. Water is a _polar_____ molecule because the electrons that oxygen shares with each hydrogen are shared unequally.
4. The oxygen atom in a water molecule has a slight _negative___ charge and each hydrogen atom has a slight _positive_ charge.
5. Methanol is soluble in water because methanol and water are both __polar_____.
6. Gasoline is not soluble in water because gasoline is _nonpolar_____.

1.
2.
3. Any point _on_____ this curve =___saturated_____.
4. Any point *below* this curve = __unsaturated_____.



1. Which substance is most soluble at 40°C? ___$NaNO_3$_____

2. How many grams of NH_4Cl will dissolve at 50°C? __50 grams_____

3. What two substances have the same solubility at 24°C? _KNO_3 and $Yb_2(SO_4)_3$

4. If you place 70 grams of KBr into 100g of water at 60°C, what type of solution have you made? unsaturated

5. How many grams of $NaNO_3$ will dissolve in 100.0g of water at 10.0°C? 80 grams

COVALENT BONDING

Write the **prefixes** for the following numbers.

21. __mono____	1	24. ___tetra__	4
22. __di_____	2	25. ___penta__	5
23. __tri ____	3	26. ___hexa___	6

Use the naming rules to **name the compounds** below (use prefixes!).

27. SO_3 _ ____sulfur tri oxide_____
28. P_2O_5 ____di phosphorous penta oxide_____
29. N_2O_3 ____di nitrogen tri oxide_____
30. CS_2 ____carbon di sulfide_____
31. OF_2 ____oxygen di fluoride_____

Use the prefixes to **write the formulas** of the compounds named below.

32. phosphorus trichloride __PCl_3___
33. carbon dioxide __CO_2_____
34. dinitrogen monoxide __N_2O_____
35. phosphorus pentabromide __PBr_5____
36. carbon tetrachloride __CCl_4____

37. Why is it necessary to use prefixes when we are naming covalent compounds but not ionic compounds?
Numerical prefixes are used to name covalent compounds of two elements (they tell the number of atoms of each element that are in the molecule).

38. When looking at the formula for a compound, how can you quickly and easily identify whether it is ionic or covalent? If the first element is a metal then the molecule is ionic, if the first element is a non-metal then the molecule is covalent.

classify each reaction as synthesis, decomposition, single replacement, or double replacement in the blank beside the reaction. Only classify if there is a blank.

	BALANCE	**CLASSIFY**
1)	____ N_2 + __3__ H_2 → __2__ NH_3	___synthesis_____
2)	__2__ $KClO_3$ → __2__ KCl + _3___ O_2	___decomposition_____
3)	__2__ NaCl + ____ F_2 → __2__ NaF + ____ Cl_2	___single replacement_____
4)	__2__ H_2 + ____ O_2 → __2__ H_2O	___synthesis_____
5)	____ CH_4 + ____ O_2 → ____ CO_2 + __2__ H_2O	combustion
6)	____ C_3H_8 + _5___ O_2 → __3__ CO_2 + __4__ H_2O	combustion
7)	__2__ C_8H_{18} + __17__ O_2 → __16__ CO_2 + __18__ H_2O	combustion
8)	_4___ P + __5__O_2 → _2___P_2O_5	____synthesis_____
9)	__2__ Na + __2__ H_2O → _2__ NaOH + ____H_2	_____single replacement_____
10)	_2___ Ag_2O → __4__ Ag + ____O_2	_____synthesis_____
11)	____ S_8 + _12__O_2 → __8__ SO_3	_____synthesis_____