

Name: Key

Date: \_\_\_\_\_

Mod: \_\_\_\_\_

ChemCom Midterm Review

1. Describe the phase changes (there are three) that occur during the water cycle (also called the hydrologic cycle).

evaporation  
Condensation  
precipitation

2. When measuring the following in a lab suggest an appropriate piece of equipment to use:

- Volume of acid needed to complete an experiment graduated cylinder
- Mass of precipitate formed by a chemical reactions balance

3. The average household mouse weighs 0.02 kg. What is this mass in g?

$$0.02 \text{ kg} = \underline{20} \text{ g}$$

$$\frac{1000 \text{ g}}{1 \text{ kg}} = \frac{x \text{ g}}{0.02 \text{ kg}}$$

4. Density is calculate as density = mass/volume. What would be the density of a solid with a mass of 46.5 grams and a volume of 38.7 mL (include the units)?

$$D = \frac{M}{V} = \frac{46.5}{38.7} = 1.20 \text{ g/mL}$$

5. If a solid is measured by displacement data below, what is the density of the solid?

- Mass = 8.94 g
- Volume of water alone = 56.9 mL
- Volume of water and object = 67.1 mL

$$V_{\text{metal}} = 67.1 - 56.9 = 10.2 \text{ mL}$$

$$D = \frac{8.94}{10.2} = 0.87 \text{ g/mL}$$

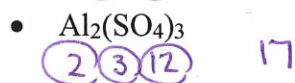
6. Would the object in question 4 float or sink if placed in a beaker of water?

no because it is > 1.0

7. Would the object in question 5 float or sink if placed in a beaker of water?

yes, because it is < 1.0

8. What is the total number of atoms in the following chemical formulas?



9. For each of the following formulas, name the elements present and give the number of atoms of each element shown in the chemical formula.

- $H_2SO_4$  (battery acid)

Hydrogen - 2                      Oxygen - 4  
Sulfur - 1

- $C_8H_{10}N_4O_2$  (caffeine)

Carbon - 8                      Nitrogen - 4  
Hydrogen - 10                      oxygen - 2

- $Zn(NO_3)_2$

Zinc - 1                      oxygen - 6  
Nitrogen - 2

10. Use the solubility curves for solids on the last page to answer the following: *Use graph in your packets or p. 42 in book*

- How much  $KNO_3$  can be dissolved in 100 grams of water at  $60^\circ C$ ?

100g  $KNO_3$

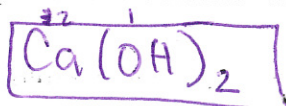
- If 100 grams of water are saturated with  $KCl$  at  $90^\circ C$  and the water is cooled to a temperature of  $40^\circ C$  what type of solution will it now be?

Supersaturated

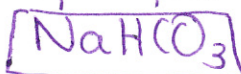
11. Use the solubility curve for gases on the last page to answer the following: *p. 44 in book*

- At  $5^\circ C$ , if 1000 g of water has 12 mg of  $O_2$  dissolved in it, is this a saturated, unsaturated or supersaturated solution?

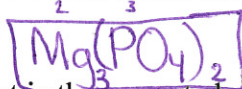
12. Calcium hydroxide is an **ionic** compound composed of calcium ions and hydroxide ions used in plaster and cement. What is the correct chemical formula? Use the ion chart on the last



13. Sodium hydrogen carbonate is an **ionic** compound commonly called baking soda. What is the correct formula? Use the ion chart on the last page.



14. What is the correct chemical formula for magnesium phosphate an **ionic** compound? Use the ion chart on the last page.



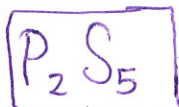
15. What is the correct chemical formula for carbon tetrafluoride, a **covalent** compound?



Cross  
Cross

No  
Cross  
Cross

16. What is the correct chemical formula for diphosphorus pentasulfide, a **covalent** compound?



17. What is the correct name for each of the following **ionic** compounds?

- $\text{Al}(\text{NO}_3)_3$  aluminum nitrate
- $\text{NH}_4\text{Br}$  ammonium bromide
- $\text{CaSO}_3$  Calcium sulfite

18. What is the correct name for each of the following **covalent** compounds?

- $\text{P}_3\text{Cl}_6$  triphosphorus hexachloride
- $\text{SiO}_2$  silicon dioxide
- $\text{B}_2\text{O}_4$  diboron tetroxide