

Final Exam Review Sheet

NAME Key
MOD _____

1. For the following decide if the characteristic represents a physical property or a chemical property and tell me your reasoning:

- Water has a density of 1.0 g/mL -
Why? Physical because measuring it does NOT change the identity
- Metals are ductile and malleable -
Why? Physical - no identity change
- Some metals become dull when exposed to air -
Why? Chemical - new substance formed (changes identity)
- Oxygen gas supports the combustion of a fuel -
Why? Chemical - new substance (change identity)
- Copper compounds are often blue or green in color -
Why? Physical - no identity change

2. For the following decide if the change described represents a physical change or a chemical change and tell me your reasoning:

- Milk turns sour if left unrefrigerated -
Why? Chemical - new substance formed
- A piece of paper is torn in half -
Why? Physical - still paper
- When vinegar and baking soda are mixed, carbon dioxide gas is formed -
Why? Chemical - new substance formed
- An ice cube melts -
Why? Physical - still water
- Your car develops rust -
Why? Chemical - new substance

3. Given the correct formulas Al_2O_3 , $SiCl_4$ and $BeCl_2$, predict the correct formulas for compounds containing:

- ↓ ↓ ↓ ↓ ↓ ↓
13 16 14 17 2 17
- Mg and F
↓ ↓ so ... MgF_2
 - B and S
↓ ↓ so ... B_2S_3
 - Sn and Cl
↓ ↓ so ... $SnCl_4$

4. Find the **molar mass** of each substance:

• the element oxygen, O 16.0g (look on P.T for O)

• the compound zinc nitrate $Zn(NO_3)_2$

$$\begin{array}{r} 1 \text{ Zn} \times 65.4 = 65.4 \\ 2 \text{ N} \times 14.0 = 28.0 \\ 6 \text{ O} \times 16.0 = 96.0 \\ \hline 189.4 \text{ g} \end{array}$$

5. If I have one **mole** of H₂O (water), how many **molecules** of water do I have?

$$6.02 \times 10^{23} \text{ molecules}$$

6. How many **moles** are there in 56.4 grams of FeF₃? $\rightarrow 1 \text{ Fe} \times 55.8 = 55.8$

$$\frac{1 \text{ mol FeF}_3}{112.8 \text{ g}} = \frac{x \text{ mol}}{56.4 \text{ g}} \quad x = 0.5 \text{ mol}$$

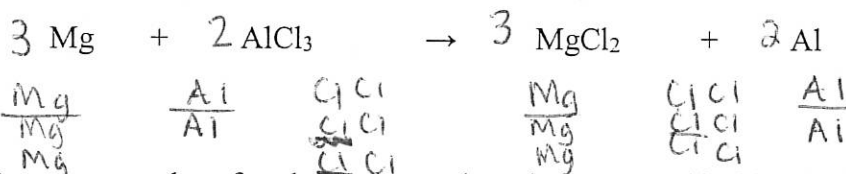
$3 \text{ F} \times 19.0 = 57.0$
112.8 g

7. How many **grams** are in 3.3 moles of potassium sulfide, K₂S? $\rightarrow 2 \text{ K} \times 39.1 = 78.2$

$$\frac{1 \text{ mol K}_2\text{S}}{110.3 \text{ g}} = \frac{3.3 \text{ mol}}{x \text{ g}} \quad x = \quad \text{g}$$

$1 \text{ S} \times 32.1 = 32.1$
110.3 g

8. a) Balance the following equation:



b) How many moles of each reactant and product are specified by the balanced chemical equation?



9. Fill in the table below.

Nuclear Symbol	Name	Protons	Neutrons	Mass Number	Electrons
${}_{31}^{67}\text{Ga}$	Gallium - 67	31	30 36	67	31
${}_{81}^{201}\text{Tl}$	Thallium-201	81	120	201	81
${}_{33}^{75}\text{As}$	Arsenic - 75	33	42	75	33
${}_{82}^{208}\text{Pb}$	Lead - 208	82	126	208	82
${}_{56}^{139}\text{Ba}^{+2}$	Barium ⁺² - 139	56	83	139	54

10. Write nuclear equations for the following:

a) the alpha decay of polonium-218 (symbol Po)



b) the beta decay of bismuth-214 (symbol Bi)



c) the gamma decay of thorium-230 (symbol Th)

