

Chem 1H Name \_\_\_\_\_ Date \_\_\_\_\_

Summer Assignment

Give name or compound formula. Also tell whether the compound is ionic, covalent, or acid.

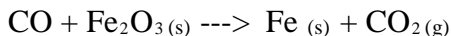
	Type	Name or Formula
1. Aluminum Chloride	_____	_____
2. $\text{Cu}(\text{IO}_4)_2$	_____	_____
3. $\text{ICl}_3$	_____	_____
4. $\text{HClO}$	_____	_____
5. $\text{CBr}_4$	_____	_____
6. $\text{Na}_2\text{Cr}_2\text{O}_7$	_____	_____
7. Barium Phosphate	_____	_____
8. Oxygen difluoride	_____	_____
9. $\text{PdSO}_3$	_____	_____
10. hydroiodic acid	_____	_____
11. Iron (II) silicate	_____	_____
12. $\text{N}_2\text{S}_3$	_____	_____
13. nitric acid	_____	_____
14. Tungsten (V) Chlorate	_____	_____
15. $\text{Zn}(\text{BrO}_2)_2$	_____	_____
16. Titanium (III) Sulfide	_____	_____
17. Sulfur dioxide	_____	_____
18. silver iodide	_____	_____
19. $\text{H}_2\text{SO}_3$	_____	_____
20. $\text{Li}_2\text{C}_2\text{O}_4$	_____	_____
21. $\text{H}_3\text{PO}_4$	_____	_____
22. Iodous acid	_____	_____
23. Calcium oxide	_____	_____
24. Bromine Septachloride	_____	_____
25. $\text{PCl}_3$	_____	_____

26. Calculate the molecular mass of each of the following
- |   |   |  |
|---|---|--|
| a. C <sub>6</sub> H <sub>5</sub> Br<br><b>(157)</b>   | b. potassium dichromate<br><b>(294)</b>   | c. Iron (III) selenide<br><b>(355)</b> |
| d. Ca(HCO <sub>3</sub> ) <sub>2</sub><br><b>(162)</b> | e. Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> ·18H <sub>2</sub> O<br><b>(666)</b>    | f. Hydrobromic Acid<br><b>(81)</b>     |
| g. phosphoric acid<br><b>(98)</b>                     | h. Na <sub>2</sub> [Pt <sub>2</sub> (CN) <sub>4</sub> ]·3H <sub>2</sub> O<br><b>(594)</b> | I. Plumbic Oxide<br><b>(239)</b>       |
27. Perform the following calculation
- 0.250 mol (CH<sub>3</sub>)<sub>2</sub>CHCOOH to grams(**22.0g**)
  - 98.6 g Nitric acid to moles(**1.57 mol**)
  - number of atoms of chlorine in 45.7g Copper(II) Perchlorate(**2.10E23**)
  - number of liters in 4.50x10<sup>23</sup> molecules H<sub>2</sub>O<sub>(g)</sub> (**16.7L**)
28. Calculate the percent composition of each element in the following compounds
- |   |   |   |
|---|---|---|
| a. Mg(HCO <sub>3</sub> ) <sub>2</sub><br><b>(65.6%O;16.6%Mg;1.4%H;16.4%C)</b> | b. BaSiO <sub>3</sub><br><b>(64.4%Ba,13.1%S;22.5%O)</b> | c. C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub><br><b>(58.5%C;4.1%H;11.4%N;26.0%O)</b> |
|---|---|---|
29. A compound has the mass percent composition: 72.22% C, 7.07% H, 4.68% N, and 16.03% O. Determine the empirical formula.  
**(C<sub>18</sub>H<sub>21</sub>NO<sub>3</sub>)**
30. What is the mass percent of Beryllium in the mineral beryl, Be<sub>3</sub>Al<sub>2</sub>Si<sub>6</sub>O<sub>18</sub>?  
**(5.0%)**
31. The empirical formula of *para*-dichlorobenzene, used as a moth repellent, is C<sub>6</sub>H<sub>4</sub>Cl<sub>2</sub>. The molecular mass of the compound is 147 g. What is the molecular formula?**(C<sub>6</sub>H<sub>4</sub>Cl<sub>2</sub>)**
32. A compound containing boron and hydrogen has the composition 6.444 g boron and 1.803 g hydrogen. The molar mass of the compound is about 28 g. What are the empirical and molecular formulas? **(BH<sub>3</sub>, B<sub>2</sub>H<sub>6</sub>)**
33. Thiophene is a carbon-hydrogen-sulfur compound used in the manufacturing of pharmaceuticals. When burned completely in excess oxygen, a 0.535 g sample produces 1.119g CO<sub>2</sub>, 0.229g H<sub>2</sub>O, and 0.407g SO<sub>2</sub>. What is the empirical formula? What is the molecular formula if the molecular mass is 252 g?  
**(C<sub>4</sub>H<sub>4</sub>S;C<sub>12</sub>H<sub>12</sub>S<sub>3</sub>)**
34. Sodium reacts with water to form sodium hydroxide and hydrogen gas:
- If 90.0 grams of sodium were dropped into 80.0 g of water, how many liters of hydrogen at STP would be produced? **(43.8 L)**
  - Which reactant is in excess and how much of it is left over? **(9.5 g H<sub>2</sub>O)**
35. Elemental phosphorus burns in oxygen gas to produce tetraphosphorus decaoxide
- If 2.50 grams of phosphorus is ignited in a flask containing 750 mL of oxygen at STP, how many grams of tetraphosphorus decaoxide are formed? **(1.87 g)**
  - Which reactant is in excess and how much of it is left over? **(1.69 g P)**

36. Magnesium burns in oxygen to produce magnesium oxide.
- If 1.00 g of magnesium is ignited in a flask containing 0.500 liter of oxygen at STP, how many grams of magnesium oxide are produced? **(1.64 g)**
  - If 0.350 g of the solid is actually produced, what is the percent yield? **(21.1%)**

37.  $\text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{C}_{12}\text{H}_{22}\text{O}_{11}(\text{s}) + \text{O}_2(\text{g})$
- How many grams of sucrose are produced from 224 liters of carbon dioxide at STP? **(285g)**
  - How many liters of carbon dioxide at STP are needed to produce 5.00 pounds of sugar? (1 kg = 2.20 lbs.) **(1790 L)**
  - What mass of water would be needed to combine with 100.0 liters of carbon dioxide at STP? **(73.7 g)**

38. One of the steps in the production of iron utilizes the following chemical reaction:



- What mass of  $\text{Fe}_2\text{O}_3$  would react with 500.0 liters of CO at STP? **(1188 g)**
- What volume of carbon dioxide ( $\text{CO}_2$ ) at STP is produced from 1000.0 grams of  $\text{Fe}_2\text{O}_3$ ? **(420 L)**
- What mass of iron (Fe) is produced when 300.0 mL of  $\text{CO}_2$  is produced at STP? **(0.498g)**

39. 75.0 grams of calcium oxide react with 130.0 grams of hydrochloric acid to produce a salt and water.
- How many grams of water are produced in the reaction? **(24.1g)**
  - If 55.0 grams of the salt were actually produced, what is the percent yield? **(37%)**

40. A solution containing 20.0 g of sodium sulfite reacts with 7.0 ml of phosphoric acid (Density = 1.83 g/ml). Determine the following:
- The mass of the excess reactant remaining at completion. **(2.45 g phosphoric acid)**
  - Grams of water produced. **(2.86g)**
  - Moles of sodium phosphate produced. **(0.106 mol)**
  - Grams of sulfur dioxide produced. **(10.2g)**