Name:			Date:			HURBAN HASSEMBLY
	<b>Chemistry</b> ~ Ms. Hart	<u>Class:</u>	Anions	or	Cations	SCHOOL FOR CRIMINAL
6.2 – Finding Molecular Formula and Percent Composition						
1.	Which is an empirical form (1) $P_2O_5$ (2) $P_4O_6$ (3) $C_2H_4$ (4) $C_3H_6$ What is the gram formula r	ula?	) 2	3.	Which pair consists corresponding (1) $C_2H_2$ and CH (2) $C_6H_6$ and $C_2H$ (3) $P_4O_{10}$ and $P_2C$ (4) $SO_2$ and $SO_3$	sts of a molecular formula and g empirical formula? J <sub>3</sub> CH <sub>3</sub> H <sub>2</sub> D <sub>5</sub>
2.	(1) 248 g/mol (2) 263 g/mol (3) 279 g/mol (4) 310 g/mol	mass of $Ca_3(PO_2)$	4)2f	4.	A compound with has a molecular r molecular formul (1) $CH_2$ (2) $C_2H_4$ (3) $C_4H_8$ (4) $C_5H_{10}$	n an empirical formula of CH₂ nass of 70 amu. What is its la?
5.	A compound has an empirical formula of CH and a molecular mass of 78 amu. What is the molecular formula of the compound?					
	(1) C <sub>2</sub> H <sub>2</sub>	(2) C <sub>3</sub> H <sub>3</sub>		(3) C <sub>4</sub> I	$H_4$	(4) C <sub>6</sub> H <sub>6</sub>
6.	A compound has an empirio formula?	cal formula of C	CH2 and a n	nolecu	lar mass of 28 am	u. What is its molecular

- 7. A compound has an empirical formula of  $CH_2$  and a molecular mass of 56 amu. What is its molecular formula?
- 8. Vitamin C has an empirical formula of  $C_3H_4O_3$  and a molecular mass of 176 amu. What is its molecular formula?
- 9. A compound has a molar mass of 90 grams per mole and the empirical formula  $CH_2O$ . What is the molecular formula of this compound?

(1)  $CH_2O$  (2)  $C_2H_4O_2$  (3)  $C_3H_6O_3$  (4)  $C_4H_8O_4$ 

- 10. If the mass of a mole of  $H_2X$  is 34 g, then X must represent
  - (1) 0
  - (2) Cl
  - (3) Kr (4) S
- 11. The empirical formula of a compound is  $CH_4$ . The molecular formula of the compound could be
  - (1)  $CH_4$
  - (2)  $C_2H_6$
  - (3)  $C_3H_8$
  - (4)  $C_4H_{10}$

## **Percent Composition Practice**

- 12. What is the percent composition by mass of carbon and oxygen in CO<sub>2</sub> (carbon dioxide)?
- 13. What is the percent composition by mass of oxygen in magnesium oxide (MgO)?
- 14. What is the percent composition by mass of oxygen in Iron(II) Oxide,  $Fe_2O_2$ ?
- 15. What is the percent composition by mass of both aluminum and sulfur in the compound, aluminum sulfate,  $Al_2(SO_4)_3$ ?
- 16. What is the percent composition by mass of oxygen in Lead (IV) oxide, PbO<sub>2</sub>?
- 17. What is the percent composition of both oxygen and phosphorous in the compound, calcium phosphate, Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>?
- 18. What is the percent composition by mass of nitrogen in ammonium nitrate, NH<sub>4</sub>NO<sub>3</sub> (gram-formula mass= 80.0 grams/mole)?
  - (1) 17.5%
  - (2) 35.0%
  - (3) 52.5%
  - (4) 60.0%
- 19. A sample of substance containing only magnesium and chlorine was tested in the laboratory and was to be composed of 74.5% chlorine by mass. If the total mass of the sample was 190.2 grams, what was the mass of the magnesium?
  - (1) 24.3 g
  - (2) 48.5 g
  - (3) 70.9 g
  - (4) 142 g
- 20. In which compound is the percent composition by mass of chlorine equal to 42%?
  - (1) HClO (gram formula mass= 52 g/mol)
  - (2)  $HClO_2$  (gram formula mass = 68 g/mol)
  - (3)  $HClO_3$  (gram-formula mass = 84 g/mol)
  - (4)  $HClO_4$  (gram-formula mass = 100 g/mol)
- 21. Find the percent composition of copper in copper (II) phosphate:  $Cu_3(PO_4)_2$
- 22. Find the percent composition of oxygen in sodium sulfate: Na<sub>2</sub>SO<sub>4</sub>
- 23. You are the CEO of a fertilizer company. You have to decide if you want to use  $NH_4$  or  $NH_3$  in your fertilizers. Both fertilizers work equally well. You are only concerned about the price of purchasing nitrogen. Which type of fertilizer should you make and why? (which fertilizer has less of a percentage of N and therefore will be cheaper?)

Challenge: Which one of the following has a lower percentage of mercury? Mercury (I) Sulfate or Mercury (II) Hydride?

Answers:

- 1. (1) 2. (4) 3. (3) 4. (4) 5. (4) 6.  $C_2H_4$ 7. C<sub>4</sub>H<sub>8</sub> 8.  $C_6H_8O_6$ 9.  $C_3H_6O_3$ 10. (4) 11. (1) 12. Carbon = 27%, Oxygen = 73% 13. 40% 14. 22% 15. Aluminum = 16%, Oxygen = 56% 16. 13% 17. Oxygen = 41%, Phosphorus = 20%18. (2) 19. (2) 20. (3) 21. 50%
- 22. 45%
- 23. 78% nitrogen versus 82% nitrogen