Name:		Date:	HURBAN EASSEMBLY
<b>Chemistry</b> ~ Ms. Hart	<u>Class:</u>	Anions or Cations	SCHOOL FOR CRIMINAL

 $\times 1000000$ 

 7 Concentration Classwork-Homework!

For Reference:		
Molarity	Parts per million	
$molarity = \frac{moles of solute}{liters of solution}$	parts per million = $\frac{\text{grams of soluto}}{\text{grams of soluto}}$	

**Example 1:** What is the concentration of 200 L solution containing 600 moles of KNO<sub>3</sub>? **Example 2:** Which solution is the most concentrated?

(1) 1 mole of solute dissolved in 1 liter of solution

(2) 2 moles of solute dissolved in 3 liters of solution

(3) 6 moles of solute dissolved in 4 liters of solution

(4) 4 moles of solute dissolved in 8 liters of solution

**Example 3:** What is the total number of moles of  $H_2SO_4$  needed to prepare 5.0 liters of a 2.0 M solution of  $H_2SO_4$ ?

**Example 4:** How many moles of solute are contained in 200 milliliters of a 1 M solution?

**Example 5:** A 3.2-gram sample of air contains 0.00074 gram of hydrogen cyanide. Determine the concentration, in parts per million, of the hydrogen cyanide in this sample.

## **Classwork!**

- 1. Which phrase describes the molarity of a solution?
  - (1) liters of solute per mole of solution
  - (2) liters of solution per mole of solution
  - (3) moles of solute per liter of solution
  - (4) moles of solution per liter of solution
- 2. A 3.0 M HCl(aq) solution contains a total of
  - (1) 3.0 grams of HCl per liter of water
  - (2) 3.0 grams of HCl per mole of solution
  - (3) 3.0 moles of HCl per liter of solution
  - (4) moles of HCl per mole of water
- 3. What is the molarity of a 500 L solution containing 5.5 moles of KI?
- 4. What is the molarity of a solution that contains 4.0 mol of NaOH in 0.50 L of solution.
- 5. Which type of concentration is calculated when the grams of solute is divided by the grams of the solution, and the result is multiplied by 1,000,000?
  - (1) molarity
  - (2) parts per million
  - (3) percent by mass
  - (4) percent by volume
- 6. A swimming pool reports that chlorine is present at 20 g in 100 g of water. Express this in terms of parts per million. (ppm)

- 7. A 2400.-gram sample of an aqueous solution contains 0.012 gram of NH3. What is the concentration of NH3 in the solution, expressed as parts per million?
  (1) 5.0 ppm
  - (1) 5.0 ppn
  - (2) 15 ppm
  - (3) 20. ppm (4) 50. ppm
- 8. How many moles of magnesium chloride (MgCl<sub>2</sub>) are needed to make 6.0 L of a 3.0 M solution?
- 9. What is the molarity of a 500 L solution containing 249 g of KI?
- 10. How many moles of LiF would be required to produce a 2.5 M solution with a volume of 1.5 L?
- 11. Determine the molarity of 500 mL of a solution with 0.35 mol of dissolved solute.
- 12. A 200 mL sample of a solution contains 4.0 g of NaOH. What is its molarity?
- 13. How many grams of  $CaCl_2$  would be required to produce a 3.5 M (molar) solution with a volume of 2.0L?
- 14. How many grams of  $KNO_3$  are present in 250 mL of 2.0 M potassium nitrate solution?
- 15. How many moles of MgSO<sub>4</sub> are contained in 50 mL of a 3.0 M solution?
- 16. The molarity of an aqueous solution of NaCl is defined as the
  - (1) grams of NaCl per liter of water
  - (2) grams of NaCl per liter of solution
  - (3) moles of NaCl per liter of water
  - (4) moles of NaCl per liter of solution
- 17. What is the molarity of 1.5 liters of an aqueous solution that contains 52 grams of lithium fluoride, LiF, (gram-formula mass = 26 grams/mole)?
  - (1) 1.3 M
  - (2) 2.0 M
  - (3) 3.0 M
  - (4) 0.75 M
- 18. Using Table G, what is the concentration of a saturated  $NaNO_3$  solution at 10 degrees Celsius in 100 mL of water (remember 1 gram of water = 1 mL of water).
- 19. CHALLENGE: Let's say that we have a supersaturated solution of  $NaNO_3$  at 10 degrees Celsius in 100 mL of water. What is the concentration of the 100 mL  $NaNO_3$  solution and WHY?!