Molarity:

- a <u>Molarity</u> description of solution concentration.

  Abbreviated M

Molarity = moles solute
Liters solution

Problems: Show all work and circle your final answer.

1. To make a 4.00 M solution, how many moles of solute will be needed if 12.0 liters of solution are required?

 $M = \frac{mo!}{l}$ 

LXM = mol = (4) (12) = 148. mol of solute

2. How many moles of sucrose are dissolved in 250 mL of solution if the solution 1000 = 0.250L concentration is 0.150 M?

mol = MxL = (0,150) (0,250) =[0.0375 mol sucrose] = 0.038 mol , sig figs.

3. What is the molarity of a solution of HNO3 that contains 12.6 grams HNO3 in 1.0 L of solution?

12.69HNO3 Imol 639HNO3 = 0.2mol HNO3

4. How many grams of potassium nitrate are required to prepare 0.250 L of a 0.700 M solution?

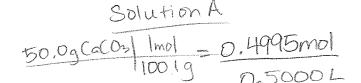
many grams of possess...

No M solution?  $mol = M \times L = (0.700)(.250)$   $= 0.175 \, mol \, KN03 \, IDI.lg \, KN03 \, \{17.7g \, mol \, RN03 \,$ 

5. 125 cm<sup>3</sup> of solution contains 3.5 moles of solute. What is the molarity of the solution?

$$M = \frac{mol}{L} = \frac{3.5}{0.125}$$
 (28 M)

6. Which solution is more concentrated? Solution "A" contains 50.0 g of  $CaCO_3$  in 500.0 mL of solution. Solution "B" contains 6.0 moles of  $H_2SO_4$  in 4.0 L of solution. SHOW WORK!



Soln B 6,0mol 4.0L = 1.5 M

7. How many liters of solution can be produced from 2.5 moles of solute if a 2.0 M solution is needed?

Solution is needed?
$$L = \frac{mo!}{M} = \frac{2.5 \, mo!}{20M} = 1.25 \, L \, \sigma_0 \, soln$$

$$\approx 1.3 \, L \, W/ \, sighi \, cos$$

8. What would be the concentration of a solution formed when 1.00 g of NaCl are dissolved in water to make 100.0 mL of solution?

## MiVi = MaVI

## **Dilutions Worksheet**

1) If I add 25 mL of water to 125 mL of a 0.15 M NaOH solution, what will the molarity of the diluted solution be?

$$(125 \text{ mL})(0.15) = (25) \text{ Mg}$$
  
 $0.75 \text{ M} = \text{ Mg}$   
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2) If I add water to 100 mL of a 0.15 M NaOH solution until the final volume is 150 mL, what will the molarity of the diluted solution be?

$$(100)(0.15) = (150)Mf$$
  
 $MF = 0.1MNaOH$ 

3) How much 0.05 M HCl solution can be made by diluting 250 mL of 10 M HCl?

$$(250)(10M) = (0.05) V_F$$
  
50,000 M= Vf

4) I have 345 mL of a 1.5 M NaCl solution. If I boil the water until the volume of the solution is 250 mL, what will the molarity of the solution be?

5) How much water would I need to add to 500 mL of a 2.4 M KCl solution to make a 1.0 M solution?

M solution? 
$$(500 \text{mL})(2.4) = (1.0) \text{Vf}$$
  $1200 \text{mL} = \text{Vf}$