

PURPOSE How Do WE  
CALCULATE "CONCENTRATION"

WARMUP copy this formula.

"Memorize This!!"

$$\text{concentration} = \frac{\text{number of particles}}{\text{Volume of solution}}$$

CAN ALSO WRITE "M"

$$\left[ \frac{\text{moles}}{\text{L}} \right] = \frac{[\text{MOLES}]}{[\text{LITERS}]}$$

#1 So "M" means moles per l

$$\text{Conc} = \frac{\text{mol}}{\text{L}}$$

$$\text{Conc} = \frac{6.5 \text{ moles KBr}}{0.022 \text{ Liters}} \leftarrow \begin{array}{l} \text{units} \\ \text{must be} \\ \text{in} \\ \text{Liters} \\ \text{ALWAYS} \end{array}$$

$$\text{Conc} = 300 \frac{\text{mol}}{\text{L}}$$

sometimes written as  
= 300M

(#2) Find the concentration  
of  
6.5 moles of KBr in  
22 milliliters of solution.

- (#3) How to solve for  
Liters.

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rearrange the same formula  
if you need to solve  
for liters:

$$\text{Conc} = \frac{\text{mol}}{\text{L}}$$

use algebra to

make it

$$\text{L} = \frac{\text{mol}}{\text{conc}}$$

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**Mole to mol/L**

**Chemistry:** <http://genest.weebly.com>  
 Stop in for help every day at lunch and Tues & Thurs after school



HINTS!

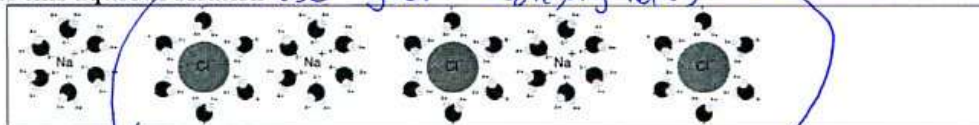
Name _____
Period _____

1. The formula for calculating molarity is concentration =  $\frac{\text{number of particles}}{\text{volume of solution}}$ .

Rewrite this formula by just putting the name of the proper units in each space below:

[     ] =  $\frac{[ \quad ]}{[ \quad ]}$  ← we gave all the units in class notes today

2. For this aqueous solution use your wednesday notes



The solute is \_\_\_\_\_ The solvent (hint: it's aqueous) is \_\_\_\_\_

3. At home, whipped cream is made by just quickly beating some liquid cream until it foams up.

The solute is AIR The solvent (~~hint: it's aqueous~~) is CREAM

4. Under a microscope, smoke is mostly tiny particles of graphite.

The solute is \_\_\_\_\_ The solvent (~~hint: it's aqueous~~) is AIR

5. What is the concentration of a solution made by adding 9.84 moles of NH<sub>3</sub> gas to water to form a solution that has a volume of 3.50 liters?

$$\text{conc} = \frac{\text{mol}}{\text{L}} \qquad \text{conc} = \frac{9.84 \text{ mol}}{3.50 \text{ L}} \qquad \text{conc} = 2.81 \text{ M}$$

6. Write the memorized formula we use for calculating molarity:

7. Rearrange that formula to solve for moles ("Get the word moles by itself on one side of the equals sign by using algebra.")

8. Rearrange the formula from #6 to solve for volume ("Get the word moles by itself on one side of the equals sign by using algebra.")

9. Calculate the molarity of 2.3 moles of potassium chloride in 0.45 liters of solution.

$$\text{molarity} = \frac{\text{moles}}{\text{liters}}$$

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10. Calculate the molarity of 1.2 moles of calcium carbonate in 1.22 liters of solution.

$$\text{molarity} = \frac{\text{moles}}{\text{liters}}$$

11. Calculate the molarity of 0.09 moles of sodium sulfate in 12 mL of solution.

12. What is the concentration of a solution made by adding 9.84 moles of  $\text{NH}_3$  gas to water to form a solution that has a volume of 3.50 liters?

13. Tell how many moles of NaCl you would need to prepare 75 mL of a 0.1 M NaCl solution. (Fix your units first!)

14. How many moles of  $\text{CuSO}_4$  must be dissolved to make 39 mL of aqueous solution that has a concentration of  $0.22 \frac{\text{mol}}{\text{L}}$ ?

15. The unit for molarity can be written as  $\frac{\text{mol}}{\text{L}}$ ? What's another symbol for molarity? \_\_\_\_\_

↑ This is in your notes from today.  
Can write the unit  $\frac{\text{mol}}{\text{L}}$  as  $\text{M}$  it still means the same thing.