

## Molarity Review Problems

- **Calculating the molarity of a solution**

1. Calculate the molarity of a solution made by dissolving 20.631 g  $\text{Ca}(\text{NO}_3)_2$  in enough water to make 475mL of solution.
  
  
  
  
  
  
  
  
  
  
2. Calculate the molarity of a solution made when 8.956 g NaCl is dissolved in enough water to make 200mL of solution.
  
  
  
  
  
  
  
  
  
  
3. If a  $\text{K}_2\text{CO}_3$  solution has a molarity of 3.00, what is the molarity of the  $\text{K}^+$  in the solution?  
(Remember that the  $\text{K}_2\text{CO}_3$  dissociates in solution, how many  $\text{K}^+$  are there for each  $\text{K}_2\text{CO}_3$ ?)

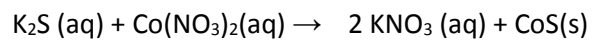
- **Using Molarity as a conversion factor.**

4. How many moles of NaCl are there in a 45.00mL sample of 2.50M NaCl solution?

5. What volume (liters is fine) of a 3.59M solution of LiCl contains 5.00 moles of LiCl?
  
  
  
  
  
  
  
  
  
  
6. What is the mass of  $\text{Mg}(\text{NO}_3)_2$  that is contained in a 26.5mL sample of .25M  $\text{Mg}(\text{NO}_3)_2$  solution?
  
  
  
  
  
  
  
  
  
  
7. I need 4.67 g of CsBr for a reaction. I found a bottle of CsBr solution in the stock room that has a concentration of 0.358M. How many mL of the solution do I need?
  
  
  
  
  
  
  
  
  
  
8. An industry wants 15.00 L of a 4.25M solution of  $\text{NH}_4\text{NO}_3$ . How many grams of  $\text{NH}_4\text{NO}_3$  are needed to make the solution?

- **Molarity in stoichiometry.**

9. Consider the reaction:

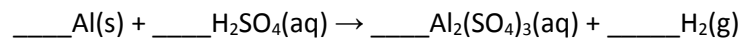


What volume of .750M  $\text{K}_2\text{S}$  is needed to form 5.00g of  $\text{CoS}$ ?

If you used the amount of  $\text{K}_2\text{S}$  you calculated above, but only recovered 3.98g of  $\text{CoS}$  instead of the 5.00 g you thought you would make, what is the percent yield of the reaction?

10. Use the reaction in the problem above to answer the following question. If I want to react 50.0mL of .95M  $\text{Co(NO}_3)_2$  completely, what volume of .465M  $\text{K}_2\text{S}$  solution would I need?

11. What volume of 6.0M  $\text{H}_2\text{SO}_4$  is needed to react with 14.20g of Aluminum in the following reaction?



12. Using the reaction above, how many grams of  $\text{H}_2$  will I form if I combine 3.58g Al with 50mL of .450M  $\text{H}_2\text{SO}_4$ ?