

Name: \_\_\_\_\_ Per \_\_\_\_\_

**Solution Concentration and Dilution**

*Practice Sheet #34*

1. Calculate the concentration of a 1.5 L solution that contains 0.24 mol of HCl.
2. Calculate the molarity of a 600 mL solution that contains 0.750 mol  $\text{NH}_4\text{Cl}$ .
3. How many moles of  $\text{AlCl}_3$  are contained in 0.25 L of 2.0 M solution?
4. What is the volume of a 5.0 M solution of  $\text{HNO}_3$  that contains 2.0 mol?
5. How many moles of  $\text{Cu}(\text{NO}_3)_2$  are contained in 400 mL of 0.90 M solution?
6. What is the volume of 0.20 M solution of  $\text{MgCl}_2$  that contains 0.30 mol?
7. Calculate the molarity of a 0.25 L solution that contains 17 g of  $\text{NaNO}_3$ .
8. Calculate the concentration of a 5.0 L solution that contains  $9.03 \times 10^{24}$  molecules of  $\text{NaOH}$ .
9. What is the mass of  $\text{KI}$  present in 200 mL of 2.00 M solution?
10. How many molecules of  $\text{H}_2\text{SO}_4$  are present in 125 mL of 0.400 M solution?
11. Describe how to prepare 0.200 L of 0.250 M  $\text{CaCl}_2$  solution.
12. Describe how to prepare 100 mL of 0.400 M  $\text{Al}(\text{NO}_3)_3$  solution.

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13. 1.5 L of a 1.0 M solution of HCL is diluted with water to a final volume of 2.5 L. Calculate the final concentration.
  
  
  
  
  
  
  
  
  
  
14. 125 mL of a 0.400 M solution of NaOH is diluted to give a solution with a concentration of 0.250 M. Calculate the final volume. What volume of water was added to the solution?
  
  
  
  
  
  
  
  
  
  
15. A 0.20 M solution of copper (II) sulfate is diluted to give 800 mL of 0.15 M solution. What was the initial volume of solution? What volume was added to the solution?
  
  
  
  
  
  
  
  
  
  
16. 2.0 L of sulfuric acid solution is diluted to give 10 L of solution with a final concentration of 0.40 M. Calculate to initial concentration.
  
  
  
  
  
  
  
  
  
  
17. 100 mL of 0.15 M potassium permanganate solution is diluted to a final concentration of 0.020 M. Calculate the final volume of the solution. What volume of water was added to the solution?
  
  
  
  
  
  
  
  
  
  
18. 400 mL of solution of iron (III) nitrate of an unknown initial concentration is diluted to give 500 mL of solution with a final concentration of 0.600 M. Calculate the initial concentration. What mass of iron (III) nitrate is found in the solution?
  
  
  
  
  
  
  
  
  
  
19. 250 mL of water are added to 150 mL of a solution of  $\text{Na}_3\text{PO}_4$  with an unknown concentration. The final concentration of the solution is 0.120 M. Calculate the initial concentration. What mass of  $\text{Na}_3\text{PO}_4$  was found in the solution?