

**DISCUSSION PROBLEMS**  
**Solution Molarities**

1. Bleach is a 0.815 M solution of sodium hypochlorite ( $\text{NaOCl}$  MW= 74.44 g/mol). 4.00 L of this solution contain how many moles and grams of  $\text{NaOCl}$ ?
2. How many grams of  $\text{NaCl}$  (MW= 58.44 g/mol) are needed to make  $2.00 \times 10^2$  L of a 0.150 M  $\text{NaCl}$  solution (a physiological saline solution)?
3. A rubbing alcohol solution is 1.70 M in isopropyl alcohol  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$  (MW= 60.10 g/mol). How many mL of solution will contain 1.00 moles of the alcohol?
4. What volume of a 0.121 M corn syrup solution (fructose,  $\text{C}_6\text{H}_{12}\text{O}_6$  MW= 180.2 g/mol) contains 10.0 grams of sugar?
5. Vinegar is a 5.00% by weight solution of ethanoic acid ( $\text{CH}_3\text{CO}_2\text{H}$  MW= 60.05 g/mol) in water. Calculate the molarity of the ethanoic acid.
6. A water sample contains benzene ( $\text{C}_6\text{H}_6$  MW= 78.11 g/mol) at a concentration of 36.0 ppb. What is the molarity of the solution? Assume solution volume equals the water volume.
7. 25.00 mL of an organic acid solution required 6.18 mL of 0.1010 M potassium hydroxide solution to exactly neutralize the acid. What was the molarity of the acid solution?
8. 50.0 mL of 0.250 M copper (II) sulfate solution slowly evaporates to leave large, blue crystals of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  (MW= 249.7 g/mol). What mass of the blue crystals from the solution should be obtained?
9. 95.0 mL of 0.555 M sulfuric acid is put on an excess of zinc. This produces zinc sulfate and hydrogen. How many grams of zinc sulfate should be made?

**ANSWERS**

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|----------------------------|---------------|----------------------------|
| 1. 3.26 moles; 243 grams   | 2. 1750 grams | 3. 588 mL                  |
| 4. 0.459 L                 | 5. 0.833 M    | 6. $4.61 \times 10^{-7}$ M |
| 7. $2.50 \times 10^{-2}$ M | 8. 3.12 grams | 9. 8.51 grams              |