

Name:

Key

Date:

18-19

Pd:

MOLARITY PRACTICE

Calculating Molarity Practice: Show all your work including units and substance. Box your final answer. **Reminder:** 1000 mL = 1 Liter

1. What is the definition, formula, and unit of molarity?

mol solute
per L solution

$$M = \frac{\text{mol}}{\text{L}} \rightarrow M$$

2. Calculate the molarity of 0.120 moles NaHCO_3 in 0.50 L of solution.

$$M = 0.24 \text{ M NaHCO}_3$$

3. Calculate the number of moles of NaCl contained in 0.500L of a 2.5M solution.

$$n = 1.25 \text{ mol NaCl}$$

4. Calculate the molarity of 3.2 moles of sugar, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ in 0.5 L of solution.

$$M = 6.4 \text{ M C}_{12}\text{H}_{22}\text{O}_{11}$$

5. What is the molar concentration of 1.0 mol of KCl dissolved in 750.0 mL of solution? (Δ to L)

0.75L

$$M = 1.3 \text{ M KCl}$$

6. Calculate the number of moles of NaOH contained in 250 mL of a 0.05M solution. (Δ to L)

.25L

$$n = 0.0125 \text{ mol NaOH}$$

7. Calculate the molarity of 29.25 grams of NaCl in 2.0 liters of solution. (Δ to mol)

$$\frac{29.25 \text{ g}}{58.44 \text{ g}} \times \frac{1 \text{ mol}}{1 \text{ mol}} = \frac{0.5005 \text{ mol}}{2.0 \text{ L}} = 0.25 \text{ M NaCl}$$

8. How many grams of NaCl are contained in the solution discussed in problem #3?

$$\frac{1.25 \text{ mol}}{1 \text{ mol}} \times \frac{58.44 \text{ g}}{1 \text{ mol}} = 73.05 \text{ g NaCl}$$

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9. Which solution is more concentrated? SHOW WORK!

a. Solution "A" contains 50.0 g of CaCO_3 in 500.0 mL of solution. 0.999 M

b. Solution "B" contains 6.0 moles of H_2SO_4 in 4.0 L of solution. 1.50 M

$$\text{a) } \frac{50.0 \text{ g}}{100.09 \text{ g}} \times \frac{1 \text{ mol}}{100.09 \text{ g}} = 0.4995 \frac{\text{mol}}{0.5 \text{ L}} = 0.999 \text{ M}$$

$$\text{b) } M = \frac{6.0 \text{ mol}}{4.0 \text{ L}} = 1.5 \text{ M}$$

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

$$V = 1.25 \text{ L solution}$$

11. What volume of a 0.25 M solution can be made using 0.55 moles of $\text{Ca}(\text{OH})_2$?

$$V = 2.2 \text{ L } \text{Ca}(\text{OH})_2 \text{ solution}$$

12. How many moles of H_2SO_4 are present in 1.63 liters of a 0.954 M solution?

$$n = 1.56 \text{ mol } \text{H}_2\text{SO}_4$$