

KEY

Molarity Practice Worksheet

Find the molarity of the following solutions:

- 1) 0.5 moles of sodium chloride is dissolved to make 0.05 liters of solution.

$$\frac{0.5 \text{ moles}}{0.05 \text{ liters}} = 10 \frac{\text{mol}}{\text{L}} \text{ or } 10 \text{ M}$$

- 2) 0.5 grams of sodium chloride is dissolved to make 0.05 liters of solution.

$$\frac{0.5 \text{ g}}{1} \times \frac{1 \text{ mol}}{58.5 \text{ g}} = \frac{0.00855 \text{ mol}}{0.05 \text{ L}} = 0.171 \frac{\text{mol}}{\text{L}} \text{ or } \boxed{0.171 \text{ M}}$$

- 3) 0.5 grams of sodium chloride is dissolved to make 0.05 mL of solution.

$$\frac{0.5 \text{ g NaCl}}{1} \times \frac{1 \text{ mol}}{58.5 \text{ g}} = \frac{0.00855 \text{ mol}}{0.00005 \text{ L}} = \boxed{171 \text{ M}}$$

- 4) 734 grams of lithium sulfate are dissolved to make 2500 mL of solution.

$$\frac{734 \text{ g Li}_2\text{SO}_4}{1} \times \frac{1 \text{ mol Li}_2\text{SO}_4}{109.9 \text{ g Li}_2\text{SO}_4} = \frac{6.679 \text{ mol}}{2.5 \text{ L}} = 2.67 \frac{\text{mol}}{\text{L}} \text{ or } \boxed{2.67 \text{ M}}$$

- 5) 6.7×10^{-2} grams of $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_4$ are dissolved to make 3.5 mL of solution.

$$\frac{6.7 \times 10^{-2} \text{ g Pb}(\text{C}_2\text{H}_3\text{O}_2)_4}{1} \times \frac{1 \text{ mol}}{443.4 \text{ g Pb}(\text{C}_2\text{H}_3\text{O}_2)_4} = \frac{1.5 \times 10^{-4} \text{ mol}}{0.0035 \text{ L}} = \boxed{0.043 \text{ M}}$$

- 6) I have two solutions. In the first solution, 1.0 moles of sodium chloride is dissolved to make 1.0 liters of solution. In the second one, 1.0 moles of sodium chloride is added to 1.0 liters of water. Is the molarity of each solution the same? Explain your answer.

No. the 1st solution will have a concentration of $\frac{1 \text{ mol}}{1 \text{ L}} = 1 \text{ M}$ the second will be $\frac{1 \text{ mol}}{\approx 1.1 \text{ L}} = \text{less than } 1 \text{ M}$