

Problem Set - Calculating Concentrations #1 - Questions

1. A solution was prepared that had a total volume of 2.30 liters by dissolving 17.0 grams of NaCl in water. Showing all of your work, what is the concentration of NaCl in this solution?

2. If 12 grams of $C_6H_{12}O_6$ were dissolved in water to give a final volume of 1.2 liters, what would be the concentration of this compound in solution? Show all work.

3. If 12.01 grams of $C_6H_{12}O_6$ were dissolved in water to give a final volume of 1.200 liters, what would be the concentration of this compound in solution? Show all work.

4. If 12 grams of $C_6H_{12}O_6$ were dissolved in water to give a final volume of 1,200 ml, what would be the concentration of this compound in solution? Show all work.

5. A solution was prepared that had a total volume of 1,245 liters by dissolving 2,444 grams of NaCl in water. Showing all of your work, what is the concentration of NaCl in this solution?

6. A solution was prepared that had a total volume of 1,245 liters by dissolving 2.444 kilograms of NaCl in water. Showing all of your work, what is the concentration of NaCl in this solution?

7. A solution was prepared that had a total volume of 1,245,000 milliliters by dissolving 2.444 kilograms of NaCl in water. Showing all of your work, what is the concentration of NaCl in this solution?

8. A solution was prepared that had a total volume of 1.245×10^3 liters by dissolving 2.444×10^3 grams of NaCl in water. Showing all of your work, what is the concentration of NaCl in this solution?

9. A solution was prepared that had a total volume of 7.846 liters by dissolving 1.256 grams of MgI_2 in water. Showing all of your work, what is the concentration of MgI_2 in this solution?

10. A solution was prepared that had a total volume of 1.6 liters by dissolving 2.4×10^{-4} grams of CdS in water. Showing all of your work, what is the concentration of CdS in this solution?

11. A solution was prepared that had a total volume of 4.81 liters by dissolving 2.4×10^{-6} grams of BaSe in water. Showing all of your work, what is the concentration of BaSe in this solution?

12. A solution was prepared that had a total volume of 2.333 milliliters by dissolving 2.4 grams of CaO in water. Showing all of your work, what is the concentration of "CaO" in this solution?

13. If 12.01 grams of $C_{12}H_{22}O_{11}$ were dissolved in water to give a final volume of 1.6 liters, what would be the concentration of this compound in solution? Show all work.

14. If 4.6 grams of C_2H_6O were dissolved in water to give a final volume of 1.6 liters, what would be the concentration of C_2H_6O in solution? Show all work.

Major Steps in Calculating the Concentrations of "Simple" Solutions:

- 1) Rewrite the information given in the text to restate the **Volume (V)** of the solution and **Weight (W)** of the solute as equations.
- 2) If required, convert the **Volume (V)** of the solution into liters.
- 3) If required, convert the **Weight (W)** of the solute into grams.
- 4) Determine the **Molecular Weight (MW)** of the solute.
- 5) Determine the **Number of Moles (n)** of the solute.
- 6) Calculate the **Concentration (C or [])** of the solute.

$$MW = W / n$$

$$W = MW \times n$$

$$n = W / MW$$

$$[] = n / V$$

$$V = n / []$$

$$n = [] \times V$$

Note #1: Show all work for all questions.

Note #2: Use the number of significant figures in your final answer that is justified by the number of significant figures of the data you were given.