

Unit 3 Review Solutions

Name: _____

Date: _____ Per: _____

***Please note that this study guide covers the calculation questions only. For a comprehensive review you should also complete the Solutions In Class Review

Format:

20 selected response, 1 BCR, 5 calculation questions

Things you will be given:

- a periodic table (it will NOT have the oxidation numbers listed)
- a common ion sheet
- all formulas and conversion factors

Things you need to know:

- how to describe the formation of solutions, including the dissociation of ionic compounds
 - how to identify the solute and solvent in a solution
 - how to determine if something is a true solution (not a suspension or colloid)
 - how to describe and identify saturated, unsaturated, and supersaturated solutions
 - how to calculate molarity, volume, moles, or mass using the molarity formula
 - how to calculate the molality of a solution
 - how to determine what volume is needed for a dilution of a stock solution
 - how agitation, temperature, surface area, type of solvent, and amount of solute effect solubility
 - how to read and interpret a solubility curve
 - how to define and identify an electrolyte
 - how to describe and calculate freezing point depression and boiling point elevation (colligative properties)
 - how to determine how changes to an equilibrium system will shift the equilibrium of the system
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1. What is the molarity of a solution containing 2.5 moles KCl dissolved in 1.0L of solution?

2. What is the molarity of a solution containing 9.33g Na₂S in 450mL of solution?

3. How many moles of solute are contained in 53.1mL of a 12.2M HCl solution?

4. How many grams of solute are contained in 64.3mL of a 1.40M H₂SO₄ solution?

5. How many milliliters of a 0.400M HBr solution can be made from 50.0mL of 8.00M HBr solution?

6. Calculate the molality of a solution formed by dissolving 15.7g NaCl in 100.0g of water.

7. What is the boiling point elevation when 11.4g of ammonia (NH_3) are dissolved in 200g of water? (The K_b value for water is $0.52^\circ\text{C}/\text{m}$) Use the steps below to solve the problem.
 - a. Convert grams of ammonia to moles of ammonia.

 - b. Convert grams of water to kg of water.

 - c. Calculate the molality of the solution.

 - d. Calculate the boiling point elevation of the solution.

8. What is the freezing point depression when 85.3g of oxygen gas are dissolved in 1500g of water? (The K_f value for water is $-1.86^\circ\text{C}/\text{m}$)