

Solutions Worksheet

On the line at the left, write the letter of the definition that best matches each term.

- | | |
|---------------------------|---|
| _____ 1. solution | a. capable of being dissolved |
| _____ 2. solute | b. solution with water as the solvent |
| _____ 3. solvent | c. substance that is dissolved in a solution |
| _____ 4. soluble | d. substance that dissolves in water to form a solution that conducts an electric current |
| _____ 5. alloy | e. solid solution containing two or more metals |
| _____ 6. aqueous solution | f. homogeneous mixture of two or more substances in a single physical state |
| _____ 7. electrolyte | g. substance that does the dissolving in a solution |

Answer each of the following questions in the space provided.

- Describe the properties of a solution
- Give two examples of solutions in nature and explain why each is important.
- Describe how a chemist can accurately prepare a solution of precise molarity.

Answer each of the following questions in the space provided.

concentration	saturated
molarity	unsaturated
molality	supersaturated

- _____ is the concentration of a solution expressed as the number of moles of solute dissolved in each liter of solution.
- A _____ solution contains as much solute as can possibly be dissolved under existing conditions of temperature and pressure
- The amount of solute in a given amount of solvent or solution is the _____ of a solution.
- A solution that contains more solute particles than are needed to form a saturated solution is _____.
- The _____ of a solution is the number of moles of solute dissolved in each kilogram of solvent.
- A solution that has less than the maximum amount of solute that can be dissolved is called a(n) _____ solution.

Solve each of the following problems as directed. Show all your work.

- What is the molarity of the solution formed by mixing 0.20 mol of sodium hydroxide with enough water to make 150 ml of solution?

17. How much potassium bromide, in grams, should be added to water to prepare 0.50 L of solution with a molarity of 0.125 M?

18. What is the molality of a solution of chlorine and water is 0.0362 *m*. This solution contains 3500 g of water. How much chlorine in grams, was used to prepare this solution?

19. What is the molarity of the solution produced when 145 g of sodium chloride is dissolved in sufficient water to prepare 2.75 L of solution?

20. To produce 3.00 L of a 1.90 M solution of sodium hydroxide, how many grams of sodium hydroxide must be dissolved.

21. How much concentrated 18 M sulfuric acid is needed to prepare 250 mL of a 6.0 M solution?

22. How much concentrated 12 M hydrochloric acid is needed to prepare 100.0 mL of a 2.0 M solution?

23. To what volume should 25 ml of 15 M nitric acid be diluted to prepare a 3.0 M solution?

24. What is the molality of a solution produced using 15.2 g of Calcium chloride and 345 g of methanol (CH₃OH)?

25. In order to prepare a 0.523 *m* aqueous solution of potassium iodide, how many grams of potassium iodide must be added to 2.00 kg of water?