

Unit 9 Solutions

1. Define solution.
2. What are the two parts of a solution? What state of matter can each be?
3. Provide a Lewis structure for water. Indicate the dipoles.
4. Illustrate how water can solvate both cations and anions, using the Lewis diagram in 3.
5. How does particle size affect solubility?
6. Why does stirring affect the rate at which a solute dissolves?
7. How does temperature affect solubility?
8. What is a saturated solution?
9. Write three identities for the statement “an aqueous solution is 46.0% KCl by mass”.
10. An aqueous solution is 23.4% NaBr by mass
 - a. how many grams of NaBr are contained in 135g of solution?
 - b. how many grams of water are contained in 25.5g of solution?
 - c. how many grams of NaBr are contained in the solution that also has 550.g of water?
11. Calculate the molarity of a solution that contains 25.8g Na₂SO₄ dissolved into 145 ml solution.
12. How many grams of H₂SO₄ are contained in 375 mL of a 0.150 mol/L solution?
13. How many mL of a 2.50 mol/L solution of nitric acid contain 22.0g HNO₃?
14. How many mL of a 0.155 mol/L solution can be made from 25.0 mL of a 0.550 mol/L solution? How much water should be added to make the 0.155 mol/L solution?
15. What molarity of hydrochloric acid solution should be used to dilute 125 mL, to make 700. mL of a 0.975 mol/L solution?
16. According to the following:
$$\text{Zn}_{(s)} + 2 \text{HCl}_{(aq)} \rightarrow \text{ZnCl}_{2(aq)} + \text{H}_{2(g)}$$
 - a. how many grams of Zn are required to react with 355 mL of a 1.20 mol/L solution of HCl?
 - b. how many mL of 0.875 mol/L solution of ZnCl₂ can be made from 31.5g Zn?
 - c. how many mL of H₂ @STP can be formed from 35.6 mL of 0.122 mol/L HCl solution?