

Ch. 12 solutions Problems

15. The solubility of a gas is 0.55 g/L at 8.0 atm pressure. What will be the solubility of the gas at 5.0 atm partial pressure?

16. Calculate the percent by mass of 2.00 mol NaCl dissolved in 225 g of water. The molar mass of NaCl is 58.5 g/mol.

17. What is the percent by volume of 15.0 mL of ethanol in 0.250 L of water?

18. What is the molarity of a methanol solution that contains 25 g of methanol in 3.5 L of a solution? The molar mass of methanol is 32 g/mol.

19. Calculate the molality of formic acid in a solution containing 44 g of formic acid in 470 g of nitrobenzene. The molar mass of formic acid is 36 g/mol.

20. Calculate the mole fraction of sodium chloride in a solution containing 129 g of sodium chloride per 2.50 mol camphor. The molar mass of sodium chloride is 58.5 g/mol.

21. If 0.80 g of sulfur dioxide at 10.00 atm pressure (P_1) dissolves in 5.00 L of water at 25.0°C, how much of it will dissolve in 1 L of water at 9.00 atm pressure (P_2) and the same temperature?

22. How would you prepare a 90.0 ml of a 1.02 M aqueous solution of sodium oxalate ($\text{Na}_2\text{C}_2\text{O}_4$) from a 2.00 M solution of ($\text{Na}_2\text{C}_2\text{O}_4$)

Name _____

Date _____

Hour _____

Chapter ~~12~~¹³ Solutions

1. Dilute 0.73g Na_2SO_4 to get a 0.30M solution.
mL solution? _____

2. Dilute 0.50g $\text{Ni}(\text{NO}_3)_2$ to get a 0.0015M solution.
mL solution? _____

3. Dilute 6.0mL of 12M HNO_3 stock to get a 0.75M solution.
mL? _____

4. Dilute 3.0mL of 8.0M H_3PO_4 stock to get a 0.90M solution.
mL? _____

5. Dilute 2.0M stock NaOH to get 125mL of 0.35M dilute solution.
mL? _____
6. Dilute 8M stock NaHCO₃ to get 250mL of 0.45M dilute solution.
mL? _____
7. Dilute 7.0mL NaHC₂O₄ stock to get 100.0mL of 0.75M dilute solution.
M? _____

Solutions

1. The solubility of a gas is 0.34 g/L at STP. What is its solubility at a pressure of 0.80 atm and the same temperature?
2. At 25°C and 1.0 atm, 0.25 g of a gas dissolves in 1.00 L of water. What mass of the gas dissolves in 1.00 L of water at 25°C and 3.0 atm?
3. 1.56 g of a gas dissolves in 2.00 L of water at a pressure of 1.75 atm. At what pressure will 2.00 g of the gas dissolve in 2.00 L of water if the temperature remains constant?
4. What is the percent by mass of 92.3 g of potassium fluoride (KF) dissolved in 1000.0 g of water?
5. A 500.0 g-sample of aqueous hydrogen peroxide (H_2O_2) contains 31.50% H_2O_2 by mass.
 - a. Find the mass of hydrogen peroxide in the solution.
 - b. Find the mass of water in the solution.
6. If 24.0 mL of methanol (CH_3OH) is dissolved in 48.0 mL of water, determine the percent by volume of methanol in the solution.
7. An aqueous solution of methanol is 45.0% methanol by volume.
 - a. Find the volume of methanol in a 250.0-mL sample of the solution.
 - b. Find the volume of water in this sample of the solution.

8. What is the molarity of a solution that contains 20.45 g of sodium chloride (NaCl) dissolved in 700.0 mL of solution?
9. Calculate the molarity of 0.205 L of a solution that contains 156.5 g of sucrose ($C_{12}H_{22}O_{11}$).
10. A 0.600-L sample of a 2.50M solution of potassium iodide (KI) contains what mass of KI?
11. What mass of ammonium chloride (NH_4Cl) would you use to prepare 85.0 mL of a 1.20M solution NH_4Cl ?
12. How would you correctly prepare 125 mL of a 0.30M solution of copper(II) sulfate ($CuSO_4$) from a 2.00M solution of $CuSO_4$?
13. A 22.0-mL sample of 12M H_2SO_4 is diluted to a volume of 1200.0 mL. What is the molarity of the diluted solution?
14. A mass of 134 g of manganese dibromide ($MnBr_2$) is dissolved in 225 g of water. What is the molality of the solution?
15. Calculate the molality of a solution that contains 106 g naphthalene ($C_{10}H_8$) dissolved in 3.15 mol carbon tetrachloride (CCl_4).
16. A solution is made by dissolving 425 g of nitric acid (HNO_3) in 535 g of water. Find the mole fraction of nitric acid in the solution.