

Molarity

1. What is the molarity of a solution made by dissolving 0.35 moles of $\text{Ba}(\text{OH})_2$ in 1.8 L of solution?
2. A student dissolves 1.4 moles of sugar in water and brings the volume up to 855 mL. Calculate the molarity of the solution.
3. A lab technician weighs out 10.75g of KNO_3 and dissolves it in some water. The final volume of the solution is 0.75 L. Find the molarity.
4. Calculate the molarity of 500.0 mL of a solution that contains 15.00 g of NaOH.
5. What is the molarity of a solution that was made by dissolving 25.25 g of $\text{Mg}(\text{NO}_3)_2$ in water and then bringing the volume to 350.0 mL?
6. If you are given 400.0 mL of a 2.0 M solution of sulfuric acid (H_2SO_4), how many moles of sulfuric acid are dissolved in the solution?
7. Your chemistry professor is going to demonstrate a reaction between concentrated sulfuric acid and a solution of sugar water. How many grams of sugar (MW: 342.30 g/mol) must be dissolved in water to reach a sugar concentration of 0.500 M if the final volume is 50.0 mL?
8. During a titration in lab, it took 35.30 mL of 1.0 M NaOH to neutralize a 20.0 mL HCl solution of unknown concentration. A) What is the molarity of the HCl solution and B) how many grams of HCl are dissolved in solution?
9. A chemist runs the following reaction: $\text{HI} + \text{NaOH} \rightarrow \text{H}_2\text{O} + \text{NaI}$ If the chemist began with 100.0 mL of 0.75 M HI solution and 80.0 mL of 1.0 M NaOH solution, A) what is the limiting reagent? B) What is the concentration of the resulting NaI solution? (Assume the reaction goes to completion and that the final volume stays constant.)

Answers

1. $0.19 \text{ mol/L} = 0.19 \text{ M}$
2. $1.6 \text{ mol/L} = 1.6 \text{ M}$
3. $0.14 \text{ mol/L} = 0.14 \text{ M}$
4. $0.7500 \text{ mol/L} = 0.7500 \text{ M}$
5. $0.4863 \text{ mol/L} = 0.4863 \text{ M}$
6. 0.80 mol
7. 8.56 g
8. A) $1.76 \text{ mol/L} = 1.76 \text{ M}$ B) 1.29 g
9. A) HI is the limiting reagent B) $0.42 \text{ mol/L} = 0.42 \text{ M}$