

AP Chemistry – Concentrations of Solutions – 37

Name _____ Per ____

1. Seawater contains 0.0079 g Sr^{2+} per kilogram of water. What is the concentration of Sr^{2+} in ppm?

2. A solution is made containing 25.5 g phenol ($\text{C}_6\text{H}_5\text{OH}$) in 495 g ethanol ($\text{CH}_3\text{CH}_2\text{OH}$). Calculate:
(a) the mole fraction of phenol;

(b) the mass percent of phenol

(c) the molality of phenol.

3. What is the molarity of each of the following solutions:

(a) 15.0 g $\text{Al}_2(\text{SO}_4)_3$ in 0.350 L solution

(b) 5.25 g $\text{Mn}(\text{NO}_3)_2 \cdot 2\text{H}_2\text{O}$ in 175 mL of solution

(c) 35.0 mL of 9.00 M H_2SO_4 diluted to 0.500 L

4. Ascorbic acid, also known as Vitamin C ($C_6H_8O_6$), is a water-soluble vitamin. A solution containing 80.5 g of ascorbic acid dissolved in 210 g of water has a density of 1.22 g/mL at $25^\circ C$. Calculate:

(a) the mass percentage of ascorbic acid

(b) the mole fraction of ascorbic acid

(c) the molality of ascorbic acid

(d) the molarity of ascorbic acid

5. Commercial aqueous nitric acid has a density of 1.42 g/mL and is 16 M. Calculate the percent HNO_3 by mass in the solution. (Hint: assume a 1.00 L solution.)

6. Describe how you would prepare 1.50 L of 0.110 M $(NH_4)_2SO_4$ solution starting with solid $(NH_4)_2SO_4$.