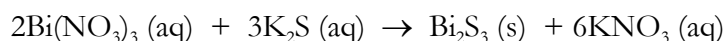


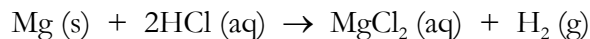
Extra Problems for Chapter 9

1. Barium sulfate is insoluble in water. If a solution of barium nitrate and water is mixed with a solution of sodium sulfate and water, what reaction will occur?
2. A solution is made by dissolving 15.0 g of AgNO_3 in enough water to make 125.0 mL of solution. What is the concentration in moles/liter?
3. You want to make 500.0 mL of a 3.0 M solution of KCl. How many grams of KCl will you need?
4. A chemist wants to make Bi_2S_3 according to the following reaction:



If the student uses 67.1 mL of a 2.9 M solution of K_2S and an excess of $\text{Bi}(\text{NO}_3)_3$, how many grams of Bi_2S_3 will be formed?

5. A chemist wants to make 50.0 grams of hydrogen gas using the following reaction:



If she has an excess of Mg, what volume of a 4.12 M solution of HCl will she need to use?

6. You make a solution by mixing 40.3 grams of MgCl_2 with 750.0 grams of water. What is the molality of the solution?
7. A chemist makes a 1.76 m solution by mixing Na_2S with 150.0 g of water. How many grams of Na_2S were used?
8. Solutions are made from water and the following solutes: NaCl , SrCl_2 , $\text{Ba}(\text{NO}_3)_2$, $(\text{NH}_4)_3\text{P}$, $\text{C}_2\text{H}_6\text{O}$, and Na_2SO_4 . If the molalities of the solutions are all the same, which will have the lowest freezing point?
9. What is the freezing point of a solution made by mixing 150.0 g of KCl with 550.0 grams of water? (K_f is $1.86^\circ\text{C}/\text{m}$ for water.)
10. What is the boiling point of the solution in #9? (K_b is $0.512^\circ\text{C}/\text{m}$ for water.)
11. The boiling point of ethanol is 78.37°C . If the boiling point of a solution of water and ethanol is 80.56°C , what is the molality of the solution? (K_b for ethanol is $1.07^\circ\text{C}/\text{m}$)