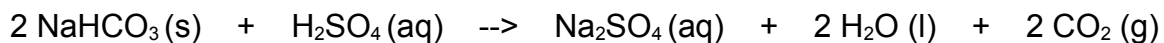


3. Some sulfuric acid is spilled on a lab bench. It can be neutralized by sprinkling sodium bicarbonate on it and then mopping up the resultant solution. The sodium bicarbonate reacts with sulfuric acid as follows:



Sodium bicarbonate is added until the fizzing due to the formation of $\text{CO}_2(\text{g})$ stops. If 35 mL of 6.0 *M* H_2SO_4 was spilled, what is the minimum mass of NaHCO_3 that must be added to the spill to neutralize the acid?

4. A sample of solid $\text{Ca}(\text{OH})_2$ is stirred in water at 37°C for a long time, until the solution contains as much dissolved $\text{Ca}(\text{OH})_2$ as it can hold. A 100 mL sample of this solution is withdrawn and titrated with $5.00 \times 10^{-2} \text{ M}$ HBr. It requires 48.8 mL of the acid solution for neutralization.

a. What is the molarity of the $\text{Ca}(\text{OH})_2$ solution?

b. What is the solubility of $\text{Ca}(\text{OH})_2$ in water, at 30°C, in grams of $\text{Ca}(\text{OH})_2$ per 100 mL of solution?

5. A solution of 100.0 mL of 0.200 *M* KOH is mixed with a solution of 200.0 mL of 0.150 *M* NiSO_4 .

a. Write the balanced chemical equation for the reaction that occurs.

b. What precipitate forms?

c. What is the limiting reactant?

d. What is the concentration of each ion that remains in solution?