

Solutions of sodium carbonate and silver nitrate react to form solid silver carbonate and a solution of sodium nitrate. A solution containing 4.50 g of sodium carbonate is mixed with one containing 3.25 g of silver nitrate. After the reaction is complete, the solutions are evaporated to dryness, leaving a mixture of salts. How many grams of each of the following compounds are present after the reaction is complete?

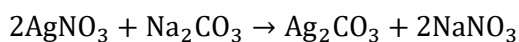
sodium carbonate?

silver nitrate?

silver carbonate?

sodium nitrate?

Solution:



$$n_1(\text{Na}_2\text{CO}_3) = \frac{4.50\text{g}}{105.9\text{g/mol}} = 0.04249\text{ mol}$$

$$n_1(\text{AgNO}_3) = \frac{3.25\text{g}}{169.87\frac{\text{g}}{\text{mol}}} = 0.01913\text{ mol}$$

$$n_2(\text{Na}_2\text{CO}_3) = \frac{0.01913\text{mol}}{2} = 0.009565\text{ mol}$$

$$n_3(\text{Na}_2\text{CO}_3) = 0.04249\text{ mol} - 0.009565\text{ mol} = 0.032925\text{ mol}$$

$$n(\text{Ag}_2\text{CO}_3) = 0.009565\text{ mol}$$

$$n(\text{NaNO}_3) = 0.01913\text{ mol}$$

$$m(\text{Na}_2\text{CO}_3) = n_3 \cdot M = 0.032925\text{ mol} \cdot 105.9\text{ g/mol} = 3.4867\text{ g}$$

$$m(\text{Ag}_2\text{CO}_3) = 0.009565\text{ mol} \cdot 275.74\text{ g/mol} = 2.6374\text{ g}$$

$$m(\text{NaNO}_3) = 0.01913\text{ mol} \cdot 84.9\text{ g/mol} = 1.6241\text{ g}$$

Answer:

$$m(\text{AgNO}_3) = 0\text{ g}$$

$$m(\text{Na}_2\text{CO}_3) = 3.4867\text{ g}$$

$$m(\text{Ag}_2\text{CO}_3) = 2.6374\text{ g}$$

$$m(\text{NaNO}_3) = 1.6241\text{ g}$$

Answer provided by www.AssignmentExpert.com