# Answer on Question #81432 – Chemistry – General Chemistry

Solutions of sodium carbonate and silver nitrate react to form solid silver carbonate and a solution of sodium nitrate. A solution containing 3.25 g of sodium carbonate is mixed with one containing 7.25 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?
1. sodium carbonate
2. silver nitrate
3. silver carbonate
4. sodium nitrate

Solution:

$Na_2CO_3 + 2AgNO_3 \rightarrow Ag_2CO_3\downarrow + 2NaNO_3$
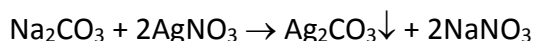
$n(Na_2CO_3) = m(Na_2CO_3) / M(Na_2CO_3) = 3.25$ g $/ 106$ g/mol $= 0.0307$ mol

$n(AgNO_3) = m(AgNO_3) / M(AgNO_3) = 7.25$ g $/ 170$ g/mol $= 0.0426$ mol

1 mole Na_2CO_3 – 2 mole $AgNO_3$

x mole Na_2CO_3 – 0.0426 mole $AgNO_3$

x = 0.0213 mole

$n(Na_2CO_3) = (0.0307 - 0.0213)$ mol $= 0.0094$ mol

$m (Na_2CO_3) = n(Na_2CO_3) \times M(Na_2CO_3) = 0.0094$ mole $\times 106$ g/mol $= 0.9964$ g

$n(NaNO_3) = n(NaNO_3) = 0.0426$ mol

$m(NaNO_3) = n(NaNO_3) \times M(NaNO_3) = 0.0426$ mol $\times 85$ g/mol $= 3.6210$ g

$n(Ag_2CO_3) = 0.0213$ mole

$m(Ag_2CO_3) = n(Ag_2CO_3) \times M(Ag_2CO_3) = 0.0213$ mol $\times 276$ g/mol $= 5.8788$ g

1. sodium carbonate = 0.9964 g
2. silver nitrate = 0 g
3. silver carbonate = 5.8788 g
4. sodium nitrate = 3.6210 g