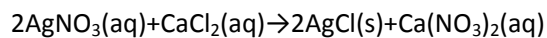


Answer on Question #39835 - Chemistry - Other

Question



Part A

What mass of silver chloride can be produced from 1.20L of a 0.178M solution of silver nitrate?

Answer:

Number of moles of AgNO_3 equals:

$$n = C \cdot V$$

C – Molar concentration of silver nitrate solution, $C = 0.178 \text{ M}$.

V – Volume of a 0.178M solution silver nitrate, $V = 1.20 \text{ L}$.

$$n(\text{AgNO}_3) = 0.178 \cdot 1.20 = 0.214 \text{ moles}$$

Then we make a proportion:

2 moles of AgNO_3 produce 2 moles of AgCl

0.214 moles of AgNO_3 – x moles of AgCl

$$x = \frac{0.214 \cdot 2}{2} = 0.214 \text{ moles}$$

$$n(\text{AgCl}) = 0.214 \text{ moles}$$

Molar mass of silver chloride equals:

$$M(\text{AgCl}) = M(\text{Ag}) + M(\text{Cl}) = 108 + 35.5 = 143.5 \frac{\text{g}}{\text{mole}}$$

Then mass of silver chloride produced from 1.20L of a 0.178M solution of silver nitrate equals:

$$m(\text{AgCl}) = n(\text{AgCl}) \cdot M(\text{AgCl}) = 0.214 \cdot 143.5 = 30.71 \text{ g}$$

Answer: $m(\text{AgCl}) = 30.71 \text{ g}$.