

## Unit 2: AP Free Response Practice #1 [6 points]

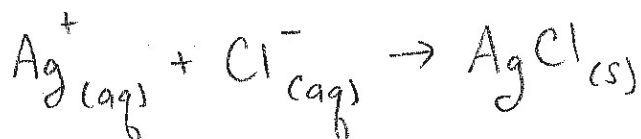
1. A 3.00 g sample of impure solid, containing sodium chloride and an inert substance, is dissolved in 200. mL of water. An excess of aqueous silver ions is added, and reaction occurs, producing a white precipitate of silver chloride. After filtering and drying, it is found that 0.450 g of solid is produced.

doesn't react!  
 ⇒ don't include in rxn

- a. Write the balanced equation for the reaction which occurs, including states. [2 points]



- b. Write the balanced net ionic equation for the precipitation reaction, including states. [1 point]



- c. Calculate the mass of chloride ions in the original impure sample. [2 points]

$$0.450 \text{ g AgCl} \times \frac{1 \text{ mol AgCl}}{143.32 \text{ g AgCl}} \times \frac{1 \text{ mol Cl}^-}{1 \text{ mol AgCl}} \times \frac{35.45 \text{ g Cl}^-}{1 \text{ mol Cl}^-} = \boxed{0.111 \text{ g Cl}^-}$$

- d. What percent by mass of the original sample was due to chloride ions? [1 point]

$$\frac{0.111 \text{ g Cl}^-}{3.00 \text{ g impure sample}} \times 100 = \boxed{3.70\% \text{ Cl}^-}$$