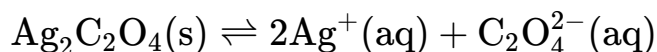


Solubility of Silver Oxalate in Acid

<https://gemini.google.com/app/fdda0c4abf1c6c7f>

Response: **First Statement Analysis:**

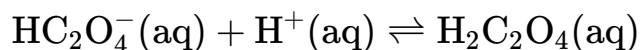
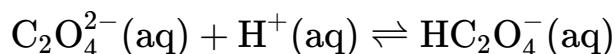
- Silver oxalate, $\text{Ag}_2\text{C}_2\text{O}_4(\text{s})$, establishes the solubility equilibrium:



- In an acidic medium like $\text{HNO}_3(\text{aq})$, the added $\text{H}^+(\text{aq})$ ions react with the basic oxalate ions ($\text{C}_2\text{O}_4^{2-}$), removing them from solution to form hydrogen oxalate (HC_2O_4^-) and oxalic acid ($\text{H}_2\text{C}_2\text{O}_4$).
- According to Le Chatelier's principle, the removal of $\text{C}_2\text{O}_4^{2-}$ shifts the solubility equilibrium to the right, increasing the molar solubility of $\text{Ag}_2\text{C}_2\text{O}_4(\text{s})$ compared to pure distilled water.
- First Statement is True.**

Second Statement Analysis:

- Oxalate ion ($\text{C}_2\text{O}_4^{2-}$) is the conjugate base of the weak diprotic acid $\text{H}_2\text{C}_2\text{O}_4$.
- In the presence of a dilute acid (H^+), protonation occurs:



- Second Statement is True.**

Relationship:

- The conversion of $\text{C}_2\text{O}_4^{2-}(\text{aq})$ to $\text{HC}_2\text{O}_4^-(\text{aq})$ and/or $\text{H}_2\text{C}_2\text{O}_4(\text{aq})$ directly explains why the concentration of $\text{C}_2\text{O}_4^{2-}(\text{aq})$ decreases, thereby driving more $\text{Ag}_2\text{C}_2\text{O}_4(\text{s})$ to dissolve.
- Thus, the **second statement is the correct explanation for the first statement.**

Correct Option: (1) *(Both statements are true, and the second statement correctly explains the first statement).*
