

Effects of the molar ratio of Hydroxide and Fluoride to Al (III) on Fluoride Removal by Coagulation and Electrocoagulation

胡景堯

Hu CY;Lo SL;Kuan WH

Abstract

The effect of the molar ratio of hydroxide and fluoride ions to Al(III) ions ($\gamma(\text{OH})$ and $\gamma(\text{F})$) on coagulation and electrocoagulation (EC) was studied to solve the problem of the over addition of acid or base. The efficiency of defluoridation was approximately 100% when the sum of $\gamma(\text{OH})$ and $\gamma(\text{F})$ ($\gamma(\text{OH}+\text{F})$) was close to 3. This finding reveals that the fluoride ions and the hydroxide ions can co-precipitate with Al(III) ions and the formula of the precipitate is $\text{Al}(\text{n})\text{F}(\text{m})(\text{OH})(3\text{n}-\text{m})$. However, when $\gamma(\text{OH})$ was less than 2.4, the defluoridation efficiency, given that $\gamma(\text{OH}+\text{F})=3$, dropped as $\gamma(\text{OH})$ fell, because the amount of aluminum polymer formed dropped. The efficiency of defluoridation of EC exceeded that of coagulation for equal $\gamma(\text{OH})$ and $\gamma(\text{OH}+\text{F})$, when $\gamma(\text{OH}+\text{F})>3$, proving the existence of an electrocondensation effect.