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The effect of aging and natural organic matter on the Th(OH)₄ solubility

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The formation and solubility of the Th(OH)₄ solid phase has been investigated as a function of the aging time and the presence of natural organic matter (e.g. humic acid) in 0.1 M NaClO₄, in the pH range between 2 and 5, and under normal atmospheric conditions. Th(OH)₄ has been prepared by alkaline precipitation and characterized by TGA, ATR-FTIR, XRD, and solubility measurements. According to the experimental data Th(OH)₄ is stable and remains the solubility limiting solid phase even in the presence of increased humic acid concentration in solution. Increasing humic acid concentration doesn't affect the crystallite size and the solubility product of Th(OH)₄ and its solubility is basically pH depended and governed by the presence of colloidal species. However, solid phase aging, which in absence of humic acid favors crystallinity, affects significantly the Th(OH)₄ solubility.

Keywords: Th(IV); solubility; humic acid; aging; particle size

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