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Summary

The kinetics of complex formation between  $\text{Al}(\text{H}_2\text{O})_6^{3+}$  ion and benzohydroxamic acid,  $\text{Al}(\text{H}_2\text{O})_6^{3+}$  ion and acetylacetonone have been measured by spectrophotometric method at 25 °C, ionic strength of 0.30 M ( with NaCl ). The solution was buffered with acetic acid and sodium acetate. The measurement were carried out in acid solution (pH 1.0-3.0) to avoid hydrolysis of the aluminum ion. The results of the reaction of  $\text{Al}(\text{H}_2\text{O})_6^{3+}$  ion and benzohydroxamic acid are interpreted according to a reaction mechanism in which the  $\text{Al}^{3+}$  and  $\text{AlOH}^{2+}$  species react with benzohydroxamic acid. The forward rate constant for  $\text{Al}^{3+}$  ion is  $2.08 \times 10^{-2} \text{ M}^{-1} \text{ s}^{-1}$  and for  $\text{AlOH}^{2+}$  is  $38.43 \text{ M}^{-1} \text{ s}^{-1}$ . The pathway for  $\text{AlOH}^{2+}$  reacting with benzohydroxamic acid has the much higher rate constant, showing the enhanced reactivity of the hydrolyzed species.

The results of the reaction between  $\text{Al}(\text{H}_2\text{O})_6^{3+}$  ion with acetylacetonone are also interpreted as for the previous reaction. The formation rate constant for  $\text{Al}^{3+}$  ion with this ligand is too small to be measured but for reaction of  $\text{AlOH}^{2+}$  ion with this ligand the value is  $0.45 \text{ M}^{-1} \text{ s}^{-1}$ . The hydrolyzed species react with acetylacetonone at a higher rate than for  $\text{Al}^{3+}$  ion because of the effect of  $\text{OH}^-$  ion in the inner sphere.