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Thiocyanatomolybdenum(V) Complexes

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Abstract

Formation of thiocyanatomolybdenum(V) complex ions $[\text{MoO}(\text{NCS})_2]^+$, $\text{H}_3[\text{MoOCl}_3(\text{NCS})_2]^+$, $\text{H}_4[\text{MoOCl}_4(\text{NCS})_2]^+$, $\text{H}_4[\text{MoOCl}_5]^+$, $\text{H}_4[\text{MoOCl}_3(\text{NCS})_3]^+$, and $\text{H}_2[\text{MoOCl}_2]^+$ (within the range of 0.7-5 mol/l HCl) and $\text{H}_4[\text{MoOBr}_3(\text{NCS})_2]^+$ and $\text{H}_4[\text{MoOBr}_5]^+$ (for 5 mol/l HBr) in aqueous solution was shown by means of spectrophotometry and mathematical simulation. As compared to bromide ions, Cl^- ions demonstrate a higher competitive ability when thiocyanato ions occur in the coordination sphere of molybdenum(V). The absence of polymeric complex species confirms the depolymerizing properties of the ligand under investigation.
