A Novel Niobium Cluster Aqua Ion with Capping μ4-Se Ligand

The aqueous solution chemistry of niobium is underexplored, and well characterized aqua complexes are scarce. In this contribution, a new niobium aqua complex was obtained by treatment of Zn-reduced ethanolic solution of NbCl5 with HCl in the presence of aselenide source (ZnSe). This is the first example of selenium containing aqua complex of niobium. The yellow-green aqua complex was isolated by cation-exchange chromatography and transformed into corresponding isothiocyanate complex by ligand exchange, which was crystallized as \((\text{PyH})_{4.5}[\text{H}_{1.5}\text{Nb}_4\text{SeO}_5\text(NCS)}_{10}]_{0.5}\text{H}_2\text{O}\). X-ray structural analysis revealed a metal-metal bonded tetranuclear\{Nb}_4(\mu_4-Se)(\mu_2-O)_5\}^{4+} core with a capping \mu_4-\text{Se} ligand.

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