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 (PyH)₄[H₁.₅ Nb₄ SeO₅(NCS)₁₀]·0.₅ H₂O. X-ray structural analysis revealed a metal-metal bonded tetranuclear{Nb₄(μ₄-Se)(μ₂-O)₅}⁴⁺ core with a capping μ₄-Se ligand.

General information
Publication status: Published
Organisations: Department of Chemistry, RAS - Nikolaev Institute of Inorganic Chemistry, Siberian Branch
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Number of pages: 5
Pages: 398-401
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Zeitschrift fuer Anorganische und Allgemeine Chemie
Volume: 645
Issue number: 4
ISSN (Print): 0044-2313
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
Original language: English
Keywords: High-valent cluster, Niobium aqua ion, Niobium, Selenide bridging ligand, Crystal structure
DOI: 10.1002/zaac.201800476
Source: FindIt
Source ID: 2443124048
Research output: Contribution to journal › Journal article – Annual report year: 2019 › Research › peer-review