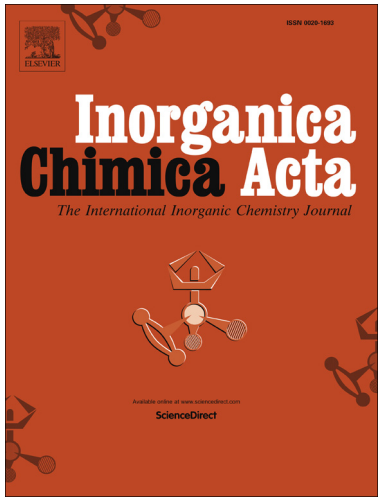

Research paper

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Synthesis of New Coordination Complexes of MF_5 (M = Nb, Ta), and Insights into the Ta(V) Reduction

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Abstract. The pentafluorides of niobium and tantalum reacted with benzophenone (Ph_2CO), (2-diphenylphosphino)phenol (DPPPh) and 4-fluorobenzonitrile affording adducts corresponding to the asymmetric (Ph_2CO and DPPPh) and symmetric (4-fluorobenzonitrile) cleavage of the tetranuclear structure of MF_5. The products were characterized by elemental analysis, IR and multinuclear NMR spectroscopy. A selection of Ta(V) complexes was investigated in the attempt to obtain tantalum tetrafluoride derivatives, which are almost unknown in the literature. The reactions with cobaltocene in dichloromethane afforded unidentified paramagnetic materials and $[CoCp_2][TaF_6]$, characterized by X-ray diffraction.

Keywords: niobium; tantalum; fluorides; electrochemistry; cobaltocene; reduction