Abstract

Aim of this thesis was the synthesis and characterization of new polyiodide anions with complexes of crown-ether and transition-metal. The resulted structural diversity of these crown-ether cations is fascinating: Solvent molecules serve to complete the coordination sphere of transition metal cations if the used crown-ether cannot do this. This can be observed for example in [Mn(H₂O)₂(18c6)](I₇)₂ and [Ni(H₂O)₆(db18c6)₃](I₃)(I₅)(CHCl₃): In [Mn(H₂O)₂(18c6)](I₇)₂ the cation is coordinated by two crown-ether and two water molecules. The compound [Ni(H₂O)₆(db18c6)₃](I₃)(I₅)(CHCl₃) has a cationic hexaaqua-complex which is surrounded by three polyether molecules due to hydrogen bonding of the Jeffrey building scheme. New triiodide, pentaiodide, heptaiodide, decaiodide and dodecaiodide anions were obtained as the compounds [Zn(H₂O)₃(15c5)](I₃)₂, [Mn(H₂O)₂(18c6)](I₇)₂, [Zn(H₂O)₆(b18c6)](I₅)(I₇)(H₂O)(b18c6), [M(12c4)]I₁₀ (M = Ca, Mn) and [M(H₂O)₆(db24c8)]I₁₂(C₂H₅OH)(H₂) (M = Ni, Zn) shows. The iodine-rich compounds [Fe(H₂O)₃(b18c6)]₄(I₈)(I₅)₄(I₃)₂(I₂)₂(B18K6)₈(H₂O)₈(THF)₂ and [Fe(H₂O)₃(b18c6)]₂(I₇)₂(I₅)₂(b18c6)₃(H₂O)₃ are described for the first time. Furthermore, the mixed anionic compound [Mn(H₂O)₄(db21c7)]₂(I₅)₂(I₃)₂(I)(C₂H₅OH)₄ could be synthesized, structurally characterized and be investigated spectroscopically. Elemental analysis, powder diffraction patterns and Raman spectra of selected compounds could be obtained.