SYNTHESIS AND CRYSTAL STRUCTURE OF BIS(CITRATO)GERMANATE AND STANNATE WITH TRIS(PHENANTHROLINE)NICKEL(II) CATION

Elena Martsinko a*, Inna Seifullina a, Elena Chebanenko a, Olha Pirozhok a, Viktoriya Dyakonenko b, Svitlana Shishkina b,c

a I.I. Mechnikov Odessa National University, 2, Dvoryanskaya str., Odessa 65082, Ukraine
b SSI “Institute for Single Crystals”, National Academy of Sciences of Ukraine, 60, Nauki ave., Kharkiv 61001, Ukraine
c V.N. Karazin Kharkiv National University, 4, Svobody sq., Kharkiv 61077, Ukraine
e-mail: lborn@ukr.net

Abstract. The new complexes \([\text{Ni(phen)}_3][\text{Ge(HCit)}_2]\cdot2\text{H}_2\text{O (1)}\), \([\text{Ni(phen)}_3][\text{Sn(HCit)}_2]\cdot3\text{H}_2\text{O (2)}\) (where phen is 1,10-phenanthroline, H\text{Cit} is citric acid) were synthesized. The identity, composition, and thermal stability of the complexes were established by elemental analysis, thermogravimetry, and IR spectroscopy. According to the data of X-ray diffraction, the bis(citrate)germanate/bis(citrate)stannate \([\text{Ge/Sn(HCit)}_2]^2-\) is the anion, while \([\text{Ni(phen)}_3]^{2+}\) is the cation in the studied complexes. The coordination polyhedrons of Ge, Sn and Ni atoms are octahedral and are formed by three pairs of oxygen atoms of different types of two H\text{Cit}^3- ligands or by three 1,10-phenanthroline molecules.

Keywords: citric acid, 1,10-phenanthroline, germanium(IV), tin(IV), nickel(II) complex.

Received: 01 September 2018/ Revised final: 28 September 2018/ Accepted: 03 October 2018