LANTHANIDE COORDINATION COMPOUNDS WITH MONODENTATE COORDINATED β-DIKETONE HETEROANALOGUE - (2,2,2-TRICHLORO-N-(DIPIPERIDIN-1-YL-PHOSPHORYL)ACETAMIDE: SYNTHESIS AND SPECTRAL INVESTIGATIONS

Olena Litsis a*, Vladimir Ovchynnikov a, Tatiana Sliva a, Svitlana Shishkina b,c, Vladimir Amirkhanov a

aTaras Shevchenko National University of Kyiv, 12, L'va Tolstogo str., Kyiv 01601, Ukraine
bState Scientific Institution ‘Institute for Single Crystals”, National Academy of Science of Ukraine, 60, Nauky ave., Kharkiv 61001, Ukraine
bV.N. Karazin Kharkiv National University, 4, Svobody sq., Kharkiv 61022, Ukraine
*e-mail: olitsis@ukr.net; phone (+380 44) 23 93 392; fax (+380 44) 23 93 393

Abstract. 14 new mononuclear six-coordinate lanthanide coordination compounds of general formula [Ln(HL)3Cl3] (Ln = La-Nd, Sm-Lu; HL = (2,2,2-trichloro-N-(dipiperidin-1-yl-phosphoryl)acetamide CCl3C(O)N(H)P(O)[N(CH2)5]2, carbacylamidophosphate (CAPh) type ligand) have been synthesized from non-aqueous solutions. The complexes have been characterized by elemental analysis, FTIR, 1H- and 31P-NMR, and UV-Vis spectroscopy. The structure of [Sm(HL)3Cl3] (1) has been further confirmed by single crystal X-ray diffraction analysis. Crystal data: trigonal, R3, with a = 24.098 Å, c = 18.025 Å, V = 9065.0 Å3, Z = 6, R1 = 0.0327, and wR2 = 0.0404. The crystal structure was solved as two crystallographically independent fragments Sm(HL)Cl: A and B that exist in the crystalline lattice due to the differences in some geometrical parameters.

Keywords: lanthanide, carbacylamidophosphate, phosphoryl ligand, six-coordinate lanthanide complex, electronic spectrum.

Received: 15 December 2017/ Revised final: 30 January 2018/ Accepted: 01 February 2018