O. Vashchenko, PhD-Student, D. Khomenko, PhD,
R. Doroschuk, PhD, R. Lampeka, Dr. Sci., rostlamp@gmail.com
Taras Shevchenko National University of Kyiv, Kyiv

SYNTHESIS AND STUDY OF COORDINATION COMPOUNDS OF URANYL ION WITH DIANION *3,3'-(2,2'-DYHYDROXYPHENYL)-DI-1,2,4-TRIAZOLE*

Synthesis and design of new ligands are very important for selective uranium extraction from nuclear waste and for the determination of its microquantities. For this reason, we synthesized 3,3'-(2,2'-dyhydroxyphenyl)-di-1,2,4-triazole (H_4L), as a model of 1,2,4-triazole containing ligands eligible for practical use, and coordination compound $UO_2(H_2L)Solv$ as well.

3,3'-(2,2'-dyhydroxyphenyl)-di-1,2,4-triazole was obtained by acylation of malonic acid hydrazide with salicylic acid iminoester in methanol solution and following intermolecular cyclization of the acylamidrazone. Obtained ligand formed neutral coordination compound with uranyl ion $UO_2(H_2L)Solv$ in metal to ligand molar ratio M:L = 1:1.

Crystal and molecular structure of the $UO_2(H_2L)Solv$ was determined by X-ray diffraction analysis. It was found that equatorial position of uranium are occupied by tetradentate coordinated ligand and one molecule of DMF. Coordination polyhedron of uranyl is a pentagonal bipyramid. Ligand comprised in complex as dianion (H_2L^{2-}) due to deprotonation of hydroxy groups, while triazole rings remaine in acidic form. Angle between planes of the phenyl and triazole rings is 21.5°, and angle between triazole heterocycles planes are 137°. The investigation of complex in solution was provided by means of NMR spectroscopy. Low-field shift of signals of protons H^1, H^2, H^4 and hydrogen of triazole, strong-field shift of signal proton H^3 in NMR spectra shows that $UO_2(H_2L)$is stable in dimethylsulfoxide solution.

Keywords: 1,2,4-triazole, NMR-spectroscopy, uranyl ion, X-ray diffraction.