Luminescence quenching of UO2(II) ion by ligands based on 2,2 ′-bipyridildicarboxylic amide

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Abstract

In recent years, f-element ions have been increasingly used as luminescent probes for determining the structure of coordination centers. Optical spectra of the uranyl ion (UO2(II)) contain a set of narrow lines in the yellow-green region. From their changes in the maximum wavelengths, intensities, and the intensity ratio, one can judge about the change in the local environment of the central heavy ion. The aim of this work was to study the luminescence quenching of uranyl ion in the presence of organic ligands based on 2,2 ' -bipyridyldicarboxylic amide with various substituents. Absorption spectra of compounds with uranyl dissolved in acetonitrile were registered on spectrophotometer Solar PB 2201. Luminescence spectra and luminescence kinetics of solutions were recorded using luminescence spectrometer Solar CM 2203. It was found that when an organic ligand is added to a uranium salt (UO2(NO3)2 6H2O), a uranyl complex is formed. It was found that in the presence of organic ligands, the luminescence characteristics of the uranyl ion change: the intensity, quantum yield, and luminescence lifetime decrease.

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