

## Structural and spectroscopy studies of complexes of the uranyl ion with 2,2'-bipyridine - N,N'-dioxide.

Autorzy

Zbigniew Hnatejko  
Stefan Lis  
Z. Stryła  
Przemysław Starynowicz

Rok wydania

2010

Czasopismo

Polyhedron

Numer woluminu

29

Strony

2081-2086

DOI

10.1016/j.poly.2010.04.001

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

2,2'-Bipyridine-N,N'-dioxide ( $\text{bypO}_2 = \text{L}$ ) complexes of the composition  $[\text{UO}_2(\text{bypO}_2)_2(\text{NO}_3)_2] \cdot 2\text{H}_2\text{O}$  ( $\text{UO}_2\text{-L}_2\text{-NO}_3$ ),  $[\text{UO}_2(\text{bypO}_2)_2\text{H}_2\text{O}](\text{ClO}_4)_2$  ( $\text{UO}_2\text{-L}_2\text{-ClO}_4$ ) and  $[\text{UO}_2\text{bypO}_2(\text{H}_2\text{O})_2\text{SO}_4]$  ( $\text{UO}_2\text{-L-SO}_4$ ) have been prepared by the reactions of the respective hydrated uranyl salts with the  $\text{bypO}_2$  ligand in water. The structures of the complexes were elucidated using elemental and thermal analyses, IR and luminescence spectroscopy as well as luminescence lifetime measurements. The IR spectra show that the bonding between uranium and  $\text{bypO}_2$ , as well as uranium and water or a counter ion ( $\text{NO}_3^-$  and  $\text{SO}_4^{2-}$ ) is formed. The nitrate or sulfate groups coordinate to the central metal ions in a monodentate manner. From TG-DTA curves, the nature of the water molecules present in the complexes and the decomposition temperature of the dehydrated uranyl complexes were determined. The thermal stability of the anhydrous uranyl complexes increases in the series:  $(\text{UO}_2\text{-L}_2\text{-NO}_3) < (\text{UO}_2\text{-L}_2\text{-ClO}_4) < (\text{UO}_2\text{-L-SO}_4)$ . All the compounds show green-yellow intense luminescence. The main fluorescence bands and the emission lifetimes in these complexes were determined. The luminescence spectra of all the prepared complexes differ from each other with respect to their peak maxima positions. The luminescence lifetimes also vary. The structure of the  $(\text{UO}_2\text{-L-SO}_4)$  complex was determined by X-ray single-crystal analysis.

Słowa kluczowe

uranyl, molecule, 2'-Bipyridine-N, N'-dioxide, complexes, spectroscopy, structure

Adres publiczny

<https://doi.org/10.1016/j.poly.2010.04.001>

Strona internetowa wydawcy

<http://www.elsevier.com>

Plik został wygenerowany dnia 2026-05-18 00:08:42

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/BkbjV-y>.