

Lanthanide Complexes of Schiff's base ligands possessing N-aryl moieties:

N(4-*n*-alkyloxysalicylidene)-4'-substituted arylamines

Nandiraju V S Rao, Manoj K. Paul, and S.Choudhury

Department of Chemistry, Assam University, Silchar – 788 011, India.

E-mail: nvsrao@sancharnet.in; Tel: +91-3842-270943, Fax: 91-3842-270802

Thatavarthi R Rao

Department of Chemistry, Banaras Hindu University, Varanasi – 221 005, India.

Abstract

The attempts at the coordination of metals, in particular f-block metals of the lanthanide group, to coordinate with any of the ligands of Schiff bases possessing an aryl moiety on the nitrogen atom presents a special experimental challenge [1], except in cases of N-(4-*n*-alkyloxysalicylidene)-4'-*n*-alkylamines. Of particular importance, we attempted to experiment with the synthesis of the lanthanide complexes with *nO(OH).m*, which may promote new molecular structures with possible extension of the molecular length with aryl or aliphatic moieties and different substituents. Our attempts proved to be successful and in this presentation we describe the synthesis and thermal behaviour of liquid crystalline Lanthanide complexes of N(4-*n*-alkyloxysalicylidene)-4'-*n*-alkylanilines. In particular Terbium, Dysprosium and Gadolinium complexes are described. Further we also experimented with Schiff bases possessing electron withdrawing groups on the N-aryl moiety, with aryl moieties being 4-fluoro-2-nitroaniline, 4-fluoro-3-nitroaniline and 2-fluoro-5-nitroaniline. The attempts proved to be successful and the results shall be presented. The stoichiometry is discussed in the light of CHN analysis and Mass spectra. The spectral data are presented for the characterization of materials. The thermal behavior is discussed using the thermal microscopy and differential scanning calorimetry results. The terbium and dysprosium complexes exhibit usual smectic A phase but gadolinium complexes exhibit unusual structures. The optical textures and thermal properties shall be presented.

1. (a) K. Binnemans, D. W. Bruce, S. R. Collinson, R. Van Deun, Y. G. Galyametdinov and F. Martin, *Phil. Trans. R. Soc. Lond. A* **357**, 3063, 1999; (b) K. Binnemans, *Material Science Forum* **315-317**, 169, 1999.