

Low-viscous nematic lanthanidomesogens

V. Dzhabarov ^a, A. Knyazev ^{a,b}, W. Haase ^c, K. Binnemans ^d and Yu. Galyametdinov ^{a,b}.

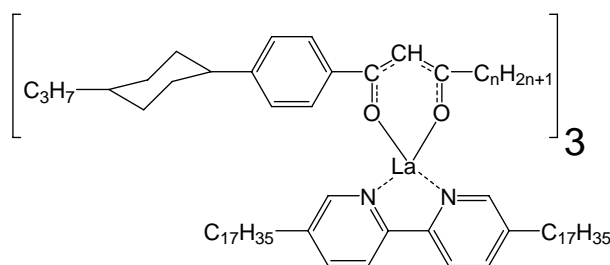
^a Kazan State Technological University, 420015 Kazan, K.Marks str., 68

^b Kazan Physical-Technical Institute, RAS, 420029 Kazan, Sibirsky tract str., 10/7

^c Institute of Physical Chemistry, Darmstadt University of Technology, Darmstadt, D-64287, Germany

^d Katholieke Universiteit Leuven, Department of Chemistry, Celestijnenlaan 200F bus 2404, 3001 Leuven (Belgium)

Series of polymorphic thermotropic lanthanum tris(β -diketonates) adducts with 5-5'-diheptadecyl-2,2'-bipyridine with low-viscosity phase have synthesized. Complexes have such a structure:



where $n = 2 \div 8$.

Table 1. Temperatures of phase transitions in °C.

n	Cr - SmA	SmA - N	N - I
2	133	146	160
3	106		136
4	74	102	142
5	76	94	134
6	73	89	138
7	64	98	132
8	74	93	132

The types of mesophases as smectic and nematic identified. Thermodynamic values and temperatures of phase transitions (tab. 1) using polarized optical microscopy and differential scanning calorimetry determined. Complex, where $n = 3$ has only nematic phase. In homological sequence $N \rightarrow I$ phase transition alternation is observed. Liquid crystal properties do not depend on ligands mesomorphism. Microscope texture photos presented on figures 1 and 2.

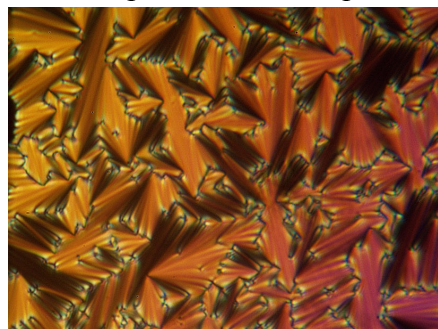


Figure 1. Fan-shaped texture of smectic A.

La(DDk₃₋₄)₃Bpy₁₇ at 90 °C.

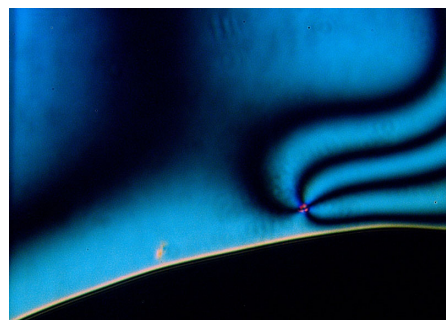


Figure 2. Shlieren texture of nematic.

La(DDk₃₋₄)₃Bpy₁₇ at 130 °C.

This work was supported by the Russian Foundation for Basic Researches project 08-03-00900-a and BRHE post-doctoral fellowship program Y5-C07-05.