

## Title Page

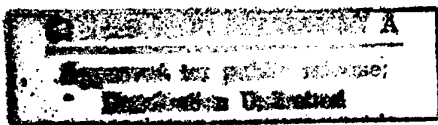
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- (2) Name of Principal Investigator Valery P. Shibaev
- (3) Name of Contractor Valery P. Shibaev
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## BODY OF THE REPORT

**(1) The Scientific Work done during the reporting period.**

During the reporting period the scientific work was continued in fourth different aspects:

- a) Synthesis of liquid crystalline (LC) dendrimers of different structure was continued. Carbosilane LC dendrimers of generation 1-4 with 8, 16, 32 and 64 terminal phenyl benzoate mesogenic groups were synthesized. Cyanobiphenyl-containing precursors with different spacer length (3-6 methylenic groups), capable of reacting with carbosilane allyl-containing dendritic matrixes, were produced.
- b) Thermal behaviour of the new LC dendrimers synthesized seed was investigated by means of microscopy and PSC methods. It is worth to note, that all LC dendrimers with methoxyphenyl benzoate mesogenic groups of generation first to four the included are crystallized as opposite to the ones with the cyanobiphenyl groups synthesized before. In addition all of them have mesophases of smectic types over wide temperature region. The structure of these mesophases are under study by X-ray measurements now.
- c) Small angle X-ray scattering (SAXS) of LC dendrimers with cyanobiphenyl groups of generations first to fourth synthesized at the beginning of the contract was performed. These investigation revealed disordered or thogonal or weakly tilted mesophases (smectics A and C) in this seria of LC dendrimers. Structure of other LC dendrimers synthesized are under investigation now.
- d) Molecular mobility of mesogenic groups in LC dendrimers of first generation with different mesogenic groups were studied by means of electrooptical birefringence method (Kerr effect). The results showed that terminal mesogenic groups orients in the electric field independantly each other like it happens in low molar liquid crystals. Measurements on the other generations of LC dendrimers are in progress.

No scientific meetings related to the Project were attended in this period.

Paper entitled «Kerr effect in solutions of carbosilane dendrimers with the terminal mesogenic groups» by E.I. Rjuntsev, N.P. Evlampieva, A.V. Lezov, S.A. Ponomarenko, N.I. Boiko, V.P. Shibaev was submitted to the journal «Liquid Crystals».

Abstract for the poster presentation was submitted to the WORKD POLYMER CONGRESS, which will be held in Australia on July 21-25 1998.

**(2) Research plans for remainder of the contract period**

1. Synthesis of LC dendrimers.

- a) Synthesis of at least five generations of carbosilane LC dendrimers with cholesteryl) terminal mesogenic groups.
- b) Synthesis of LC dendrimers with different spacer length (3, 4, 5, 6 methylenic groups).
- c) Synthesis of LC dendritic statistical copolymers.

2. Study of phase behavior and structure of all LC dendrimers by the optical polarizing microscopy, DSC and X-ray methods.

3. Investigation of molecular properties of solutions of LC dendrimers.

**(3) During the reported period no significant administrative actions were made.**

**(4)**