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LIQUID CRYSTALLINE BENZO/1,2-d:5,4-d'/BISOXAZOLES

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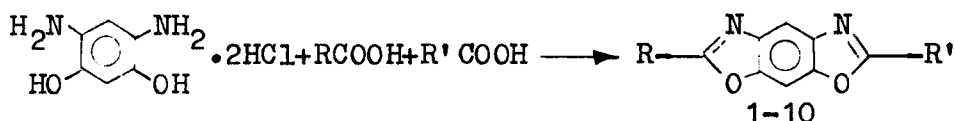
Abstract A number of benzo/1,2-d:5,4-d'/bisoxa-
 zoles have been synthesized. Only derivatives con-
 taining a cyclohexane ring exhibit liquid crystal-
 line phases.

INTRODUCTION

In search of new nematic liquid crystals, we have syn-
 thesized a number of benzobisoxazole derivatives. We
 proceeded from the fact that the rigid rod polymers
 containing benzobisthiazolic^{1,2} or benzobisoxazolic
 fragments³ exhibit liquid crystalline properties.

DISCUSSION

Benzobisoxazoles (1-10) were obtained via condensation
 of 4,6-diaminoresorcinol dihydrochloride with appro-
 priate acids in polyphosphoric acid by a general me-
 thod⁴.












Symmetric benzobisoxazoles (1-3,7,10) were puri-
 fied by column chromatography on silica with CHCl_3
 as eluent. Asymmetric compounds (4-6,8,9) were isola-
 ted from the corresponding symmetric homologues by

recrystallization from hexane, purified by column chromatography and finally refined by vacuum sublimation.

The structure of the compounds was confirmed by mass- and UV-spectroscopy data.

TABLE 1 Phase transition temperatures

No	R	R'	Phase transition temperature (°C)
1	C ₃ H ₇	C ₃ H ₇	C- 89-I
2	C ₅ H ₁₁	C ₅ H ₁₁	C- 61-I
3	C ₆ H ₁₃	C ₆ H ₁₃	C- 58-I
4	H	C ₆ H ₁₃ - 	C-191-I
5	C ₅ H ₁₁	C ₆ H ₁₃ - 	C-142-I
6	C ₆ H ₁₃	C ₆ H ₁₃ - 	C-144-I
7	C ₆ H ₁₃ - 	C ₆ H ₁₃ - 	C-291-I
8	C ₃ H ₇	C ₄ H ₉ - 	C - 99-N-118-I
9	C ₆ H ₁₃	C ₄ H ₉ - 	C - 90 -S _A - 96-N-106-I
10	C ₄ H ₉ - 	C ₄ H ₉ - 	C - 237-N-264-I

Thus, dialkylbenzobisoxazoles (1-3) exhibit no liquid crystalline properties.

Increasing geometric anisotropy of molecules by inserting aryl substituents leads to no mesophase. Only introduction of a cyclohexane ring results in liquid crystalline state. Actually, benzobisoxazoles (8,9) containing one cyclohexane fragment show mesophases at much lower temperatures as compared to the symmetrical dialkylcyclohexylbenzobisoxazole (10).

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