176. Substituted 2-Phenylnaphthalenes, a New Class of Nematic Liquid Crystals

Preliminary Communication

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Summary

Eleven representatives of 6-*n*-alkoxy- and 6-*n*-alkanoyloxy-2-(4′-cyanophenyl)-naphthalenes, a new class of nematogens, are described.

Substituted biphenyls and *p*-terphenyls are important, commercially used nematogens [1]. We have now found that 6-*n*-alkoxy- (**2** and **4**) and 6-*n*-alkanoyloxy-2-(4′-cyanophenyl)naphthalenes (**5**) have wide-range nematic phases and may be of interest as such or in eutectic mixtures of nematogens.

Compounds **2**, **4** and **5** were obtained according to the *Scheme*. The *Grignard* reagent of 2-bromo-6-methoxynaphthalene (**1**) [2] with $ZnCl_2 \cdot 2\,Et_2O$ was converted to the naphthyl-zinc chloride [3] which, in the presence of $Pd(PPh_3)_4$ [4] gave with 4-bromobenzonitrile 2-(4′-cyanophenyl)-6-methoxynaphthalene (**2**) in 63% yield. The methyl ether **2** was cleaved with BBr_3 in CH_2Cl_2 [5]. Finally, ethers **4** were obtained from naphthol **3** and the respective alkylbromide in cyclohexanone (or acetone)/K_2CO_3 [6] and esters **5** by a phase transfer catalyzed reaction with the respective acyl chloride. All compounds were identified by the usual spectroscopic techniques and elemental analysis.

Table 1. *Yields and transition temperatures of compounds* **2** *and* **4**

	R	Yield [%][a])	*C-N* [°C]	*N-I* [°C]
2	–	63	138	184
4a	C_2H_5	41	129	185
4b	n-C_3H_7	33	114	157
4c	n-C_4H_9	32	125	159
4d	n-C_5H_{11}	44	96	148
4e	n-C_6H_{13}	33	100	148
4f	n-C_7H_{15}	42	84	140
4g	n-C_8H_{17}	48	[b])	140

[a]) Yields refer to **1** and are based on products purified by column chromatography.
[b]) *C, S*-transition 85°C; *S, N*-transition 94°C.

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Scheme

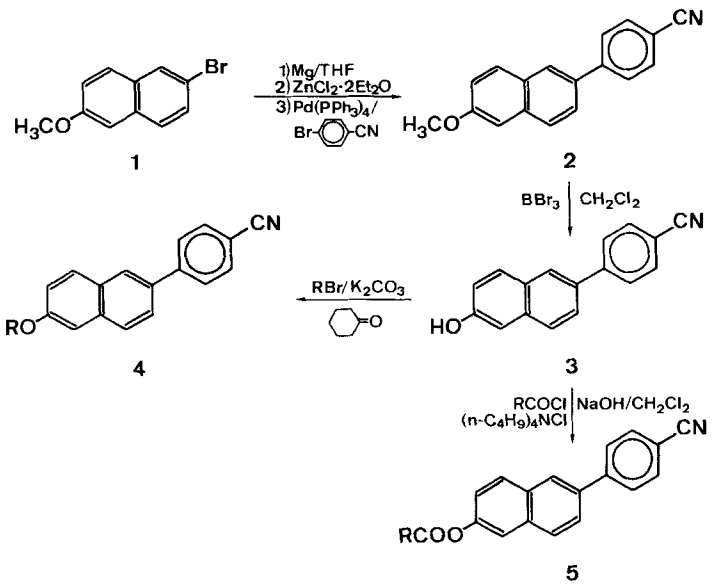

Table 2. *Yields and transition temperatures of compounds* **5**

	R	Yield [%][a])	*C-N* [°C]	*N-I* [°C]
5a	n-C_4H_9	31	87	167
5b	n-C_5H_{11}	36	75	163
5c	n-C_6H_{13}	38	64	155

[a]) Yields refer to **1** and are based on products recrystallized once.

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