

149. Mesomorphic Properties of Some 6-*n*-Alkyl-2-(4'-cyanophenyl)naphthalenes

Preliminary Communication

by Urs Lauk, Peter Skrabal and Heinrich Zollinger

Technisch-Chemisches Laboratorium, Eidgenössische Technische Hochschule, CH-8092 Zürich

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Summary

The synthesis of the title compounds **4** is described and their transition temperatures are compared with the nematic phases of the respective 6-*n*-alkoxynaphthalene derivatives.

In a recent communication we reported on 6-*n*-alkoxy- and 6-*n*-alkanoyloxy-2-(4'-cyanophenyl)naphthalenes as first representatives of a new class of nematic liquid crystals [1]. Here we describe the title compounds **4**, the lower homologues of a third series in this class. They exhibit wide-range nematic phases with N-I transitions lower (28° (C₇) to 45° (C₃)) than the respective *n*-alkoxy analogues (C₂ to C₆; *Figure*). This is to be expected, since the anisotropic polarizability is reduced by substitution of *n*-alkoxy terminal groups by *n*-alkyl groups [2].

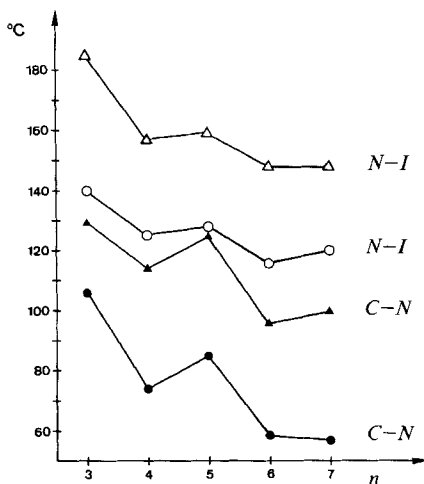


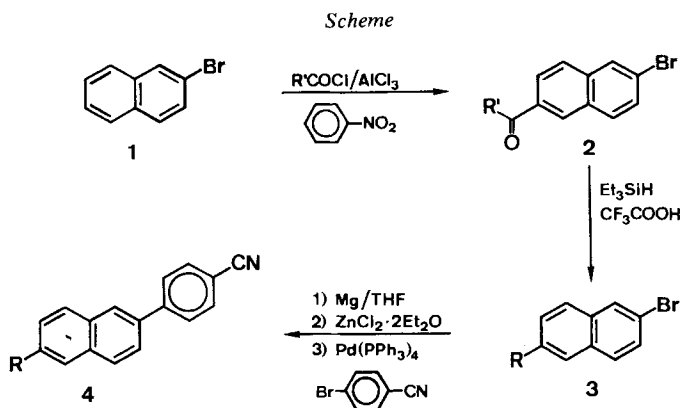
Figure. Transition temperatures as function of number of atoms in the terminal group (●, ○: *n*-alkyl derivatives; ▲, Δ: *n*-alkoxy derivatives)

Compounds **4** were synthesized according to the *Scheme*. The 6-*n*-alkanoyl-2-bromonaphthalenes **2** were obtained by *Friedel-Crafts* acylation [3] of **1** and then reduced to the respective alkynaphthalenes **3** by triethylsilane in CF_3COOH [4]. The *Grignard* reagents of **3** [5] with $\text{ZnCl}_2 \cdot 2\text{Et}_2\text{O}$ were converted to the naphthylzinc chlorides [6] which, in the presence of $\text{Pd}(\text{PPh}_3)_4$ [7] gave with 4-bromobenzonitrile the title compounds **4**. All compounds were identified by the usual spectroscopic techniques and elemental analysis.

Table. Yields and Transition Temperatures of Compounds **4**

	R	Yield [%] ^{a)}	C–N [°]	N–I [°]
4a	<i>n</i> -C ₃ H ₇	5	106	140
4b	<i>n</i> -C ₄ H ₉	17	74	125
4c	<i>n</i> -C ₅ H ₁₁	1	85	128
4d	<i>n</i> -C ₆ H ₁₃	10	58	116
4e	<i>n</i> -C ₇ H ₁₅	10	57	120

^{a)} Yields refer to **1** and are based on products purified by column chromatography and distillation.



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