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## SIDE CHAIN POLYMERS CONTAINING 4-(5-ALKYLATED 2-THIENYLCARBONYLOXY)BENZOIC ACID

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**Abstract** The synthesis of a series of 4-(5-substituted 2-thienylcarbonyloxy)benzoic acid is reported. Their mesomorphic behaviour is investigated by DSC and polarizing microscopy, indicating schlieren textures. Esters of the above compounds with  $\omega$ -alkenyl substituents are reacted with poly(hydrogenmethylsiloxane) to give alkylated side chain poly(methylsiloxane)s, which are investigated by the same methods. The alkylated poly(methylsiloxane)s with long spacers have schlieren textures.

In the recent years a large number of studies has been made concerning liquid crystalline side chain polymers with phenyl benzoate moieties<sup>1-5</sup>). We are investigating analogous compounds exchanging the benzene to a thiophene system. In this paper, we report the syntheses and the mesomorphic behaviour of 4-(5-alkylated 2-thienylcarbonyloxy)benzoic acids. Their esters with  $\omega$ -alkenyl substituents have been reacted with poly(hydrogenmethylsiloxane).

### SYNTHESIS

The 4-(5-alkylated 2-thienylcarbonyloxy)benzoic acids have been synthesized from 2-alkylthiophene

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RESULTS

All 4-(5-alkylated 2-thienylcarbonyloxy)benzoic acids (1-3) have a schlieren texture studied by polarizing microscopy and DSC measurements. The thermal transitions are listed in Tab. I. The compounds decompose before they become isotropic. Although 1 has no substitution in the position 5 of the thiophene ring, it has mesomorphic behaviour. The allylester, the undecenylester of 2 and 3 and the polymers 4 and 5 do not have liquid crystalline behaviour by either calorimetric or microscopic examination. The side chain poly(methylsiloxane)s 6 and 7 that have a spacer with eleven methylene units have mesogenic behaviour. They have a schlieren texture.

TABLE I: Thermal transitions\* [°C]

No.	transition temperature				
<u>1</u>	c	224	sch	dec	
<u>2</u>	c	195	sch	dec	
<u>3</u>	c	136	sch	dec	
<u>4</u>	g	?	i		
<u>5</u>	g	-35	i		
<u>6</u>	g	-37	sch	21	i
<u>7</u>	g	-50	sch	-25	i

\* by DSC and polarizing microscopy;

c = crystalline, g = glassy, sch = schlieren texture, i = isotropic, dec = decomposed

In comparison with the known polysiloxanes with phenyl benzoate mesogens<sup>3, 8-10</sup>) our polysiloxanes with the thienylcarbonyloxybenzoic acids have a glass temperature below 0°C and the mesogenic phases are at lower temperatures as the analogous aromatic polysiloxanes. Besides, our side chain poly(methylsiloxane)s are only liquid crystalline, if they have a long spacer with eleven methylene units. Polymers having a spacer with three methylene units do not have mesogenic behaviour.

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