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T. Shibata [a] , M. Kimura [a] & K. Ogasawara [b]

[a] Asahi Denka Kogyo K.K, Urawa Saitama, 336-0022, Japan

[b] Tohoku. Univ., Sendai, Aobayama, 980-8578, Japan

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Novel Chiral Dopants From Optically Active 2.4-Pentanediol (II)

T. SHIBATA[a*], M. KIMURA[a] and K. OGASAWARA[b]

[a]*Asahi Denka Kogyo K.K Urawa Saitama 336–0022, Japan and* [b]*Tohoku. Univ, Sendai, Aobayama 980–8578, Japan*

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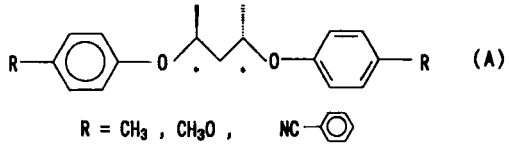
A variety of chiral dopants from optically active 2.4-pentanediole were prepared



The temperature coefficient of the induced cholesteric pitch of compound(A) was measured to show that dP/dT depended on substituent group R. When R=$CH_3$and CH_3O, compounds(A) shows positive dP/dT. But when R=Benzonitrile group, compound(A) shows negative dP/dT.

Keywords: chiral dopant; optically active 2.4-pentanediol; helical pitch

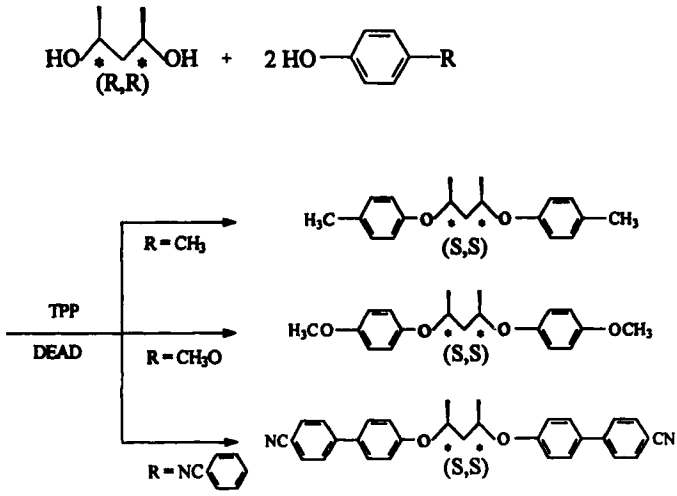
INTRODUCTION

It is well known that the temperature coefficient of an induced cholesteric pitch can be controlled by blending of a chiral dopant having right-handed and left-handed twist.[1)] The temperature coefficient was also controlled by adding a chiral dopant having negative or positive dP/dT with the same twist.[2)]

We report the dP/dT of compounds(A) from optically active 2.4-pentanediol.

* Corresponding Authors.

These compounds were prepared from corresponding phenols and optically active 2.4-pentanediol by one-pot reaction (Schem I) and showed a useful short helical pitch (Table II) for STN and phase transition mode liquid crystal mixtures.



SCHEME I

TABLE I **Chemical structutics of chiral dopants**

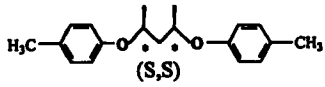
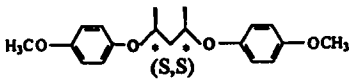
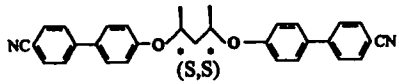
No	*Chemical structores*
1	
2	
3	

TABLE II **Induced cholesteric pitch and configuration**

No	×	*Y*	$P_{30}(\mu m)$	P_{60}/P_{30}
1	S.S	L	10.3	1.25
2	S.S	L	6.6	1.20
3	S.S	L	7.8	0.95

X: Absolute configuration. Y: Twist sense.

P_{30}: Induced cholesteric pitch of ZLI-1565 with 1% chiral dopant at 30°C.

As shown in Table II, the relationship between the temperature coefficient andthe substituent group of compound(A) are as follows: CH_3 and $CH_3O > 0$, Benzonitrile group <0.

Moreover the relationship between an induced cholesteric pitch and the substituent group of compound (A) are: CH_3 > Benzonitril group > CH_3O.

It can, therefore, be said that selection of the substituent group of compound(A) determined what the temperature coefficient and induced cholesteric pitch will be.

References

1. Jpn. Kokai 80–38869.
2. Mol. Cryst. Liq. Cryst., 1993, Vol. 237, pp 483–485.