

## Temperature Dependence of Dynamic Viscoelastic Properties for Dicholesteryl Alkanedioates

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A dynamic viscoelastic measurement is very sensitive to a structural change accompanied by a phase transition. Therefore, this method can be utilized to a study on phase transition behavior of liquid crystals. We previously reported on the dynamic viscoelastic properties of cholesteryl alkanooates(1). The characteristic change of the storage modulus ( $G'$ ) was observed in their cholesteric phases, whereas no phase change was observed within the temperature region. In this study, the dynamic viscoelastic properties of dicholesteryl alkanedioates (abbreviated to diChA- $n$ , where  $n$  is the number of carbon atoms in the methylene chain,  $n=8-17$ ) have been measured as a function of temperature. The measurements were made using a rheometer (UBM Rheosol-G2000) with a cone-plate rotating shear geometry. The cone angle was 0.1rad, the diameter was 15mm, and the center gap was 0.050mm. The frequency was 62.8rad/sec (10Hz) and the scanning rate of temperature was 2°C/min. From the results obtained on the cooling, a remarkable even-odd effect was observed on the dynamic viscoelastic properties. In the case of odd number series, the value of  $G'$  abruptly increased around the phase transition temperature from the isotropic liquid to the cholesteric phase observed on the DSC measurements. And then, the  $G'$  value decreased whereas the cholesteric phase still remained except for diChA-9. This behavior is the same as that of the cholesteryl alkanooates(1). On the other hand, the  $G'$  value of the even members did not increase around the transition from the isotropic melt to the cholesteric phase. Except for diChA-8 and 10, the increasing of the  $G'$  was delayed for 10°C or more. After the increasing, the  $G'$  value kept constant within the cholesteric phase without a decreasing. More detail behavior and the reason of the difference between the even and the odd series will be discussed.

### References

- (1) T.Hanasaki, K.Fukui, A.Kawamura, *Abst. of 9th European Conference on Liquid Crystals*, 2007, P113.