Carrier mobility behavior of triphenylene mesogen with a hydrogen bonding amide group

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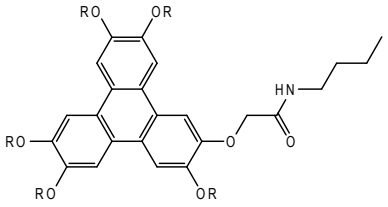
Liquid crystal is one of the promising materials as an organic semiconductor because a high carrier mobility has been found in mesophase which is comparable to that of a-Si (0.1 cm^2/Vs). However, the carrier mobility is required to improve and the fluctuation control of molecules is an interesting strategy for this issue. In this work, a triphenylene mosogen which has hydrogen bond interaction was studied on carrier mobility behavior.



$R=C_5H_9$: Cryst 73°C Col_h 152°C

1

A triphenylene which has an alkylamide substitute instead one of the peripheral alkoxy chains (Scheme 1) [1]. The mobility was measured by a Time-Of-Flight (TOF) technique. A transient photocurrent decay curves of **1** in the hexagonal columnar (Col_h) mesophase is shown in Fig. 1. The carrier mobility for the positive charge is 3.5 x 10^{-4} cm/Vs which is lower than that of a triphenylene mesogen with pentyloxy tails (C5OTP). Intracolumnar hydrogen interaction negatively affects the formation of carrier transport path.

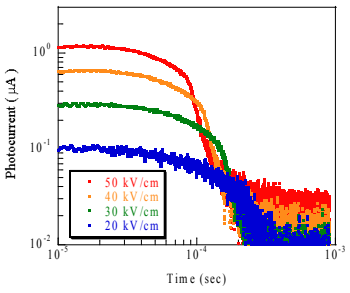


Fig. 1 Transient photocurrent decay curves of **1** at 145 °C.

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References

[1] B. -Q. Wang, K.-Q. Zhao, P. Hu, W. -H. Yu, C. -Y. Gao and Y. Shimizu, *Mol. Cryst. Liq. Cryst.* **2007**, *479*, 135.