## Crystal Structure and Phase Transition Behavior of Non-symmetrical Dimeric Liquid Crystals with a Terminal Fluorine Atom in One of the Mesogenic Groups and with Two Lateral Fluorine Atoms in the Other

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The relationship between the crystal structure and the phase transition behavior of 4-(4-fluorobenzoyloxy)phenyl 4-(4-n-hexyloxybenzoyloxy)-2,3-difluorophenyl alkanedioate (I), abbreviated to 4FdiF-n (n=4-12), is discussed in this study.



The phase transition behavior of 4FdiF-n has been studied using a differential scanning calorimeter and a polarizing optical microscope. From the results, 4FdiF-n except for n=10 exhibited enantiotropic nematic phases, and the phase transition points showed a clear odd-even effect depending on the number of carbon

atoms in the flexible methylene spacer (Fig.1). In addition, we have carried out the crystal structure

analyses of 4FdiF-7 and 4FdiF-8. The results showed a distinction between the structures with odd and even members; in the crystal structure of 4FdiF-7, the molecules formed layers in which pairs of molecules were arranged in antiparallel, as can be seen in Fig.2a. In contrast, the crystal structure of 4FdiF-8 adopted an interdigitated structure (Fig.2b). On the basis of differences between the crystal structures of odd and even members, we will discuss the odd-even effect in the phase transition behavior of 4FdiF-*n*.



Fig.1 Phase transition behavior of 4FdiF-n:  $T_{\rm m}(\circ)$  and  $T_{\rm cl}(\bullet)$ .



Fig.2 Crystal structures of (a) 4FdiF-7 and (b) 4FdiF-8. H atoms are omitted for clarity.