

Structure-Property Relationships of Polar Mesogens Containing Sulfur

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The ferroelectric nematic phase, N_F , has become one of the most prominent topics in the field of liquid crystal research since its experimental discovery in 2017[1,2] and assignment in 2020.[3] The N_F phase is a variant of the conventional nematic phase, N , which is the least ordered liquid crystalline phase and has been widely used in display devices. The N_F phase has huge potential towards driving the next generation of devices because it requires a lower energy cost compared to existing technology due to the dipoles already being aligned.[4] To date there have been around a 200 low molar mass compounds which exhibit the phase[5] and the vast majority of these can be described using the three following structures, namely RM734,[1] DIO[2] and UUQU-4N[6], Figure 1. The observation of further new polar phases [7,8] has highlighted the need to continue the synthesis and characterization of new mesogens in this structure space. Here we report the transitional properties of a number of sulfur-containing compounds which exhibit both polar and non-polar phases and then investigate their structure-property relationships with regards to the stability of the observed polar phases.

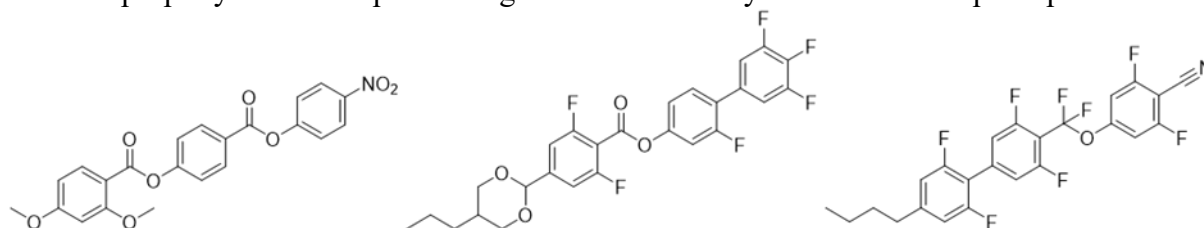


Figure 1. Molecular structure of (left) RM734, (middle) DIO and (right) UUQU-4N.

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