

## **Synthesis, characterization and polymerization of thiophene units anchored with an imine-type mesogen group**

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### **Abstract**

Thiophene structures anchored in position 3 of the ring were synthesized using spacers of different lengths (6,8,10, and 12 carbon atoms linked to a 2-((4-octyl-phenylimino)methyl)phenol) group. The thermal studies of the units demonstrated that they possess liquid-crystal properties and their optical study indicated that all the compounds present a nematic phase. Further chemical polymerization of these units was performed by oxidation of the respective monomers using iron(III) chloride. The resulting polymers proved to be insoluble and therefore their characterization was only possible by XPS and FT-IR techniques. In addition, as the polymers have no melting point because they decompose at temperatures over 200 °C, it was not possible to determine if they were effectively liquid-crystals. Finally, the iodine-doped polymers displayed conductivities of about  $10^{-7}$  S cm<sup>-1</sup>, i.e., semiconductor-like conductivity.

### **Keywords**

Thiophene, Nematic Phase, Liquid Crystalline Phase, Thiophene Ring, Tetrabutylammonium Bromide.