

## **Synthesis, characterization and determination of liquid crystal properties of molecules with Schiff base linking units and cinnamaldehyde moiety**

### **ABSTRACT**

A series of liquid crystal molecules with two Schiff base linking units and a cinnamaldehyde core with different terminal groups were synthesized and characterized. The intermediates of 4-heptyloxybenzaldehyde (1a) and 4-dodecyloxybenzaldehyde (1b) were synthesized through the alkylation of 4-hydroxybenzaldehyde with a series of bromoalkane. A condensation reaction of cinnamaldehyde, 1,4-phenylenediamine and a series of substituted benzaldehydes with different terminal groups such as bromo, chloro, hydroxy, cinnamaldehyde, hydrogen, methoxy, heptyloxy and dodecyloxy produced a series of new cinnamaldehyde-based compounds, 2–9, respectively. All these compounds were characterized using Fourier transform infrared (FTIR) spectroscopy, nuclear magnetic resonance (NMR) spectroscopy, and CHN elemental analysis. The liquid crystal properties of these compounds were determined using polarized optical microscopy (POM), and their transitions were further confirmed using differential scanning calorimetry (DSC). Compounds with chloro, bromo, methoxy, heptyloxy, and dodecyloxy substituents are mesogenic compounds with nematic phase behavior. However, the other compounds were found to be nonmesogenic without any mesophase transitions.