

Synthesis and Characterization of Non-mesogenic Behavior of Chalcone Derivatives

ABSTRACT

A series of new chalcone derivatives with different alkyl chain lengths ($C_{10}H_{21}$, $C_{12}H_{25}$, and $C_{14}H_{29}$) have been successfully synthesized and characterized. An initial alkylation reaction of 4-hydroxybenzaldehyde alkyl bromides (decyl, dodecyl, and tetradecyl) formed intermediates 1a, 1b, and 1c, which were further reacted with 4-hydroxyacetophenone through Claisen Schmidt condensation method to form chalcone derivatives 2a, 2b, and 2c. These compounds were characterized using Fourier Transform Infrared (FTIR) spectroscopy, Nuclear Magnetic Resonance (NMR) spectroscopy, and Carbon, Hydrogen, and Nitrogen (CHN) elemental analysis. The compounds' transition mesophases were determined using Polarized Optical Microscope (POM). However, all the compounds were found non-mesogenic without any liquid crystal properties due to the nonlinearity of the structures.