Synthesis and characterization of ethyl cellulose-based liquid crystals containing azobenzene chromophores

Abstract

Two compounds based on the ethyl cellulose having azobenzene side chain mesogenic units were prepared and the structures of the cellulosic liquid crystals were confirmed by Fourier transform infrared (FTIR) and nuclear magnetic resonance (NMR) spectra. Liquid-crystalline properties were characterized by differential scanning calorimetry and polarizing optical microscopy in which compound 4a shows a columnar phase and compound 4b shows a semectic A phase. The absorption spectra of the azobenzene units display a high-intensity π-π* transition at about 364 and 366nm for compounds 4a and 4b, respectively, and a lower intensity πn-π* transition at around 468nm for both compounds. Hence, photochromism can be achieved by the introduction of the azo linkage to ethyl cellulose containing liquid crystals. Copyright © Taylor & Francis Group, LLC..