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## Study of phase separation and anomalous molecular behavior of Jojoba oil using Dielectric Spectroscopy

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### Abstract

Jojoba oil is composed almost entirely of liquid wax ester. Because growing conditions, harvesting and storage treatment can affect the composition of these waxes. Broadband dielectric spectroscopy and differential scanning calorimetry are complementary combined to study the molecular dynamics at the phase transitions, and in between, over temperatures range from -100 up to 100 °C. Two different trends are found up and down a non-equilibrium or *meta-stable* state region. In addition, The rheological behavior and physicochemical properties of jojoba oil was studied, which revealed that the jojoba oil has a Newtonian behavior at low shear rate but it has non-Newtonian at high shear rate; it has also effective in controlling the oxidative deterioration. The chemical identification of jojoba oil using gas chromatography technique indicates that the main components were eicosenic and docosenic acids; it was concluded that the jojoba oil contained little or no glycerin and that most of its components fell in the chain-length range of C36-42.

Keywords: Jojoba oil; BDS; Tzero<sup>TM</sup> Technology; Relaxation time; Dielectrics

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