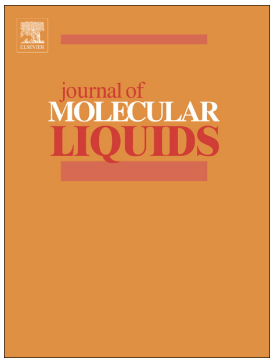

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Acoustical studies of synthesized *α,β*-unsaturated ketones in ethanol and different percentage composition of DMSO in ethanol

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ABSTRACT

In the present investigation chalcones were synthesised by aldol condensation of acetophenone with aromatic aldehyde in basic medium and products were characterized by ^{1}H NMR and ^{13}C NMR spectra. These synthesized chalcones were then dissolved in pure ethanol and ethanol solutions containing 10%, 30% and 50% dimethyl sulphoxide (DMSO) to obtain binary and ternary solutions of various concentrations. Density, ρ, viscosity, η and speed of sound, u of these solutions were measured over a wide range of temperature (298.15 K to 308.15 K). Various acoustical parameters like adiabatic compressibility, intermolecular free length, acoustic impedance, relaxation time and free volume have been evaluated by using the measured values of density, viscosity and speed of sound. The obtained results are interpreted in terms of molecular interactions that give us an idea of structure-making or structure-breaking ability of solute molecules in different solvents.

Keywords: Chalcones, density, viscosity, speed of sound and acoustical parameters.

1. Introduction

1,3-diarylprop-2-en-1-one is frequently known as chalcone. The compounds having chalcone moiety have been reported to possess various biological activities such as anti-inflammatory[1], antimicrobial [2], antifungal [3], antioxidant [4], antimalarial [5], antituberculosis [6], anti HIV [7] and antitumor [8]. As these are α,β-unsaturated ketones, the presence of double bond in conjugation with carbonyl group is believed to be responsible for the biological activities of chalcones [9]. Ultrasonic techniques have found wide range of applications in various fields. These plays a crucial role in solution theory, water treatment, nuclear power generation, chemical engineering design, civil engineering, molecular dynamics in chemical industries and emulsification [10-14], etc. Ultrasonic energy is used for the synthesis of various chemical substances and to study chemical processes.