

Thermo-physical properties of Jatropha Curcas Biodiesel + Diesel Fuel No.2 Binary Mixture at T= (288.15 to 308.15K) and Atmospheric Pressure

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The fast diminishing resources of fossil fuels, increasing prices of crude oil, and environmental concerns have been the diverse reasons for exploring the use of vegetable oils as alternative fuels. Vegetable oil-based fuels (Bio fuels) are promising alternative fuels for diesel engines because of their environmental and strategic advantages. To design equipment for biofuel production and an optimizing process for biodiesel production, the thermo-physical properties must be known. In this work, the thermo-physical properties, densities (ρ_{12}) and speed of sound (v_{12}), for Jatropha curcas biodiesel (1) + diesel fuel No.2 (2) binary mixtures were measured as functions of composition at temperatures ranging from T= (288.15 to 308.15K) and atmospheric pressure. The observed data has been utilized to evaluate the excess molar volume, and excess isentropic compressibilities, $(\kappa_s^E)_{12}$ of these binary mixtures and were fitted to Redlich-Kister polynomial equation to predict adjustable parameters along with standard deviations. This binary mixture (blends) exhibits a temperature-dependent behavior and densities decreased linearly with temperature.