Formulation and Characterization of Sustainable Oil Microemulsions and their application in Biofuel

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Abstract

Nowadays there is a great focus on maintaining the environment and thinking about ways to reduce the harmful gases that are released daily into the atmosphere, as a result of the petroleum products burning. Also there is a lack of energy sources such as, petroleum and its derivatives. So, we must find alternatives depending on natural products as renewable energy source which does not harm the environment and reduces air pollution.

Microemulsion-based fuels in the presence of water in a thermodynamically stable microemulsion can successfully be used to reduce soot formation. When water is vaporized during the combustion, this will lower the heat released and the combustion temperature. As a direct consequence, the emission rate of gases like nitrogen oxides (NOx) and carbon monoxide (CO) will decrease. Fuel microemulsion consisting of four-component systems, lemon and diesel as oil phase /sucrose laurate (C-1216) , (C-1205) as sugar ester nonionic surfactant/pentanol , propanol and ethanol as co-surfactant and water, were studied.

Ternary phase diagrams, determined at 25°C, show large isotropic single-phase nano-structured microemulsion regions and small anisotropic liquid crystal regions.