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STABILIZATION OF MICROEMULSIONS USING LIQUID CRYSTALS AND NANO PARTICLES

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Microemulsions have a wide range of applications in the pharmaceutical and cosmetic industries.. They are transparent and thermodynamically stable being stabilized by organic emulsifiers. Oil-in-water emulsions can be stabilized by solid particles. Known as Pickering emulsions, they are regularly used in many technological applications. The key parameters for stabilizing emulsions are the surface charge of the particles depending on pH and salt concentrations and their contact angle depending on the surface groups and the polarity of the oil phase. The aim of the present study was to investigate the effect of nanoparticles and liquid crystals and temperature of emulsion formation on the stability of the microemulsions. We used MgO nano particles and liquid crystal, Beta Sitosteryl glucopyranosidetetraacetate, as stabilizers at room temperature and at 70^0C. MgO nanoparticles synthesized in the laboratory are white, odourless, non toxic powders that can easily disperse. Liquid crystals are organic substances that have properties between a conventional liquid and a solid. Liquid crystals with emulsification properties are capable of stabilizing emulsions. Emulsions were prepared using water, olive oil and span 80 (surfactant). Citric acid which has a buffering capacity from pH 2.5 – 6.5 was used to adjust the pH of microemulsions to 5.5.

Microemulsions prepared at 70 ^{0}C were found to be more stable than those formulated at room temperature. Incorporation of a small amount of MgO nanoparticles and liquid crystal, Beta Sitosterylglucopyranosidetetraacetate, transformed unstable macro and phase-separated emulsions to microemulsions.

Therefore, MgO nanoparticles and liquid crystals can be used as stabilizers for microemulsion formulation at 70 ^{0}C. However, they do not stabilize the emulsions formed at room temperature.