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Surfactant-Free O/W-Emulsion as Drug Delivery System

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Abstract : Most of the drugs used for pharmaceutical purposes are poorly water-soluble drugs. About 40% of all newly discovered drugs are lipophilic and the numbers of lipophilic drugs seem to increase more and more. Drug delivery systems such as nanoparticles, micelles or liposomes are applied to improve their solubility and thus their bioavailability. Besides various techniques of solubilization, oil-in-water emulsions are often used to incorporate lipophilic drugs into the oil phase. To stabilize emulsions surface active substances (surfactants) are generally used. An alternative method to avoid the application of surfactants was of great interest. One possibility is to develop O/W-emulsion without any addition of surface active agents or the so called “surfactant-free emulsion or SFE”. The aim of this study was to develop and characterize SFE as a drug carrier by varying the production conditions. Lidocaine base was used as a model drug. The injection method was developed. Effects of ultrasound as well as of temperature on the properties of the emulsion were studied. Particle sizes and release were determined. The long-term stability up to 30 days was performed. The results showed that the surfactant-free O/W emulsions with pharmaceutical oil as drug carrier can be produced.

Keywords : emulsion, lidocaine, Miglyol, size, surfactant, light scattering, release, injection, ultrasound, stability
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