15th International Conference on
PHARMACEUTICAL FORMULATIONS & DRUG DELIVERY
September 17-18, 2018 | Philadelphia, USA

Benzalconium lactate as multifunctional ionic liquids for pharmaceutical applications

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Room Temperature Ionic Liquids (RTIL) are organic salts that are in liquid form at room temperature. The physicochemical properties and biological activities of ILs depend on the nature and the size of the cation and anion. Therefore, they could be simply tuned by selecting different combinations of available ions. In the last few years, ILs have been increasingly exploited as pharmaceutical active ingredients as well as excipients in drug delivery systems. In the present work, the properties of benzalconium lactate [BA][Lac] were tested in terms of its suitability as an ingredient in dermal formulations. We were able to show, that it strongly increases the solubility of poorly water-soluble drugs. The solubility of 4-hydroxybenzoic acid propyl ester in [BA][Lac] was about 153 mg/ml. Furthermore, the antimicrobial activity is comparable with that of benzalconium chloride. Minimal inhibitory concentrations values for [BA][Lac] are between 10 and 18 mmol/L independence of the tested species. Therefore, the use as an antimicrobial agent is possible. [BA][Lac] could be successfully incorporated into hydrogels up to 1%, resulting in stable formulations. In contrast, the incorporation into emulsions results in a decreased viscosity and lower stability in some cases. Due to its long alkyl chain, [BA][Lac] can act as an emulsifying agent with cationic character and thus influence the placement of other emulators on the droplet surface.

Biography

Dorota Anna Dobler has completed his PhD at the age of 28 years from Leibniz Institute for Solid State and Material Research Dresden (IFW Dresden). She is a research assistant at the Technische Hochschule Mittelhessen- University of Applied Sciences, Institute of Bioprocess Engineering and Pharmaceutical Technology, Gießen, Germany. She has published more than 20 papers in reputed journals.

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