



Crystals

an Open Access Journal by MDPI

CiteScore: 5.0

Impact Factor: 2.4

Special Issue Reprint

Eutectic Solvents

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Natural deep eutectic solvents (NADES) are pharmaceutically accepted systems not only because they typically offer a serious enhancement of active pharmaceutical ingredient (API) solubility, but also due to their non-toxicity. This fortunate conjuncture allows for designing new media for escalation and controlled release of APIs. For example, composition optimisation of a series of NADES comprising choline chloride with multi-hydroxyl compounds was successfully performed for a set of sulphonamide-based drugs. These results confirmed that NADES in general, and the ones based on choline chloride and glycerol particularly, are an attractive alternative to traditional solvents for sulphonamide dissolution. Experiments augmented with *in silico* modelling can offer deeper insights into the thermodynamic characteristics of these systems and an explanation for the origin of the observed solubility enhancement. Research of this type offers universal resolutions to the problem of low solubility issues for many types of drugs. Of particular interest is that such screening is not restricted to artificial *in vitro* environments but can be also easily adopted for the study of modelled *in vivo* situations. One of very important and interesting examples is a new curcumin-NADES formulation preserving its beneficial properties even after dilution with FaSSiF solution, which mimicks intestinal absorption.

