

# The Design and Evaluation of Novel Encapsulation Technique for Topical Application of Alpha Lipoic Acid

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## Abstract

Cubosomes are discrete, sub-micron, nanostructured particles of the bicontinuous cubic liquid crystalline phase. Such novel particles are utilized to encapsulate guest molecules which are either hydrophilic, lipophilic or amphiphilic, due to the compartmentalization of its structure. Cubosomes usually have been produced by means of time-consuming methods involving high energy input (Top-down approach). However, the application of high energy is regarded as a barrier to temperature sensitive ingredients and is difficult to scale up. As a result, it was useful to develop a process for producing cubosomes that requires no significant energy input as the (Bottom-up approach). The purpose of this study was to evaluate the efficiency of both approaches in fabrication of cubosomes. Dispersions were characterized by visual inspection, optical and transmission electron microscopy, encapsulation efficiency and in-vitro release. Results indicated that the bottom-up approach using less energy input was more efficient in generation of smaller cubosomes with higher encapsulation efficiency and slower release rate.

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