



Physical Stability and Absorption increase of Encapsulated Vitamins with Liposomal Carrier to Formulate Therapeutic Cream for Psoriasis Disease treatment

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Abstract

One of the negative aspects of vitamins is their low absorption through skin. Also, the combination of water or lipo-soluble vitamins and their biological properties protection such as anti-oxidant are difficult for formulating in therapeutic products. Encapsulation of these macromolecules, by liposomal carrier is an important method to preserve their native properties. The aim of this research is producing multi-layer liposomes for encapsulation of vitamins D₃, E, A, C and B₅ and increasing physical stability of vitamins in therapeutic cream for psoriasis disease treatment. In the current study, liposomes containing vitamins were prepared with thin-film hydration-sonication method. According to FTIR and DSC results, no interaction was observed between encapsulated vitamins and liposome constituents. The particlesize, and its distribution and encapsulation efficiency were respectively calculated about 250 nm, 0.70–0.85 and more than 92%. Also, liposomes morphology analysis by scanning electron microscopy (SEM) showed Spherical form for multi-layer vesicles. Then liposomal carriers were formulated in anti-psoriasis cream to compare its absorption rate and effectiveness with/without encapsulated vitamins. For treated group with liposomal cream, the results showed an increase in its absorption rate through skin (less than 4 minutes) and rapid improvement of lesions (in comparison with cream without vitamin vesicles). So, it can be said the liposomes containing bioactive materials and macromolecules have therapeutic potential applications, improvement of drugs shelf life and its stability in cosmetic products. In this field, physical stability of vitamins in various industry (such as medicine and dermatology) are most important effect of encapsulation method and liposomes as cover, play the great protection role against vitamins degradation.

Keywords: lipo-soluble vitamins, encapsulation, drug delivery, dermatology, liposome

Biography

Azadeh Izadyari has completed her master in chemical engineering. Currently, she is a doctoral student in chemical engineering, University of Ayatollah Amoli Branch. Her thesis is in field of drug delivery and has published many papers in reputed journals. Now, she is working in Pars Azmae Teb(Cerita) as scientific head of southern Iran and Researcher in R&D.

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