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Palm Olein Emulsion: a Novel Vehicle for Topical Drug Delivery of Betamethasone 17-Valerate (Article)

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Abstract

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This study aims to investigate the use of palm olein as the oil phase for betamethasone 17-valerate (BV) emulsions. The physicochemical properties of the formulations were characterized. In vitro drug release study was performed with the Hanson Vertical Diffusion Cell System; the samples were quantified with HPLC and the results were compared with commercial products. Optimized emulsion formulations were subjected to stability studies for 3 months at temperatures of 4, 25, and 40°C; the betamethasone 17-valerate content was analyzed using HPLC. The formulations produced mean particle size of 2–4 µm, viscosities of 50–250 mPa.s, and zeta potential between –45 and –68 mV. The rheological analyses showed that the emulsions exhibited pseudoplastic and viscoelastic behavior. The in vitro release of BV from palm olein emulsion through cellulose acetate was 4.5 times higher than that of commercial products and more BV molecules deposited in rat skin. Less than 4% of the drug was degraded in the formulations during the 3-month period when they were subjected to the three different temperatures. These findings indicate that palm olein -in-water emulsion can be an alternative vehicle for topical drug delivery system with superior permeability. © 2017, American Association of Pharmaceutical Scientists.

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Author keywords

[betamethasone 17-valerate emulsions](#) [in vitro drug release tests](#) [palm olein](#) [rheology](#) [stability study](#)

Indexed keywords

EMTREE drug terms:

[betamethasone valerate](#) [carbomer](#) [cellulose acetate](#) [chlorocresol](#) [methyl paraben](#)
[norethisterone](#) [palm oil](#) [polysorbate 20](#) [propyl paraben](#) [propylene glycol](#)
[sorbitan laurate](#) [triolein](#)

EMTREE medical terms:

[animal experiment](#) [animal tissue](#) [Article](#) [controlled study](#) [drug degradation](#)
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[drug stability](#) [emulsion](#) [flow kinetics](#) [high performance liquid chromatography](#) [male](#)
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Manufacturers:

Drug manufacturer:

Apollo, China;

Sigma Aldrich

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