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Design, Formulation, and Evaluation of Transdermal Patch of Propranolol Hydrochloride using Chamomile Essential Oil as Permeation Enhancer

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SUMMARY. **The purpose of the present study was to develop a matrix type transdermal patch containing propranolol hydrochloride with different ratios of hydrophobic (eudragit) polymeric system by the solvent evaporation technique by using 30 w/w of dibutyl phthalate to the polymer weight, incorporated as plasticizer. Formulated transdermal films were physically evaluated about the thickness, weight variation, drug contents, flatness, folding endurance, and moisture contents. All formulations indicated good physical stability. *In vitro* permeation studies of the formulations were performed using Franz diffusion cells. Drug release follows zero order and the mechanism of release is diffusion from the polymer. The permeation of drug across the rabbit skin was increased in the presence of chamomile oil. Higher cumulative permeation (%), flux and enhancement ratio of drug permeation was found when 6% of chamomile oil was used.**

RESUMEN. El propósito del presente estudio fue desarrollar un parche transdérmico de tipo matriz que contenga clorhidrato de propranolol con diferentes proporciones de sistema polimérico hidrofóbico (eudragit) mediante la técnica de evaporación del solvente utilizando 30 w/w de ftalato de dibutilo al peso del polímero, incorporado como plastificante. Las películas transdérmicas formuladas se evaluaron físicamente sobre el espesor, la variación de peso, el contenido del fármaco, la planeidad, la resistencia al plegado y el contenido de humedad. Todas las formulaciones indicaron buena estabilidad física. Los estudios de permeación *in vitro* de las formulaciones se realizaron usando células de difusión Franz. Se demostró que la liberación del fármaco sigue el orden cero y el mecanismo de liberación es la difusión desde el polímero. La permeabilidad del fármaco a través de la piel del conejo aumentó en presencia de aceite de manzanilla. Se encontró una mayor permeación acumulativa (%), flujo y relación de mejora de la permeación del fármaco cuando se usó 6% de aceite de manzanilla.

KEY WORDS: chamomile oil, eudragit, patch, propranolol hydrochloride, transdermal.

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