Research in Pharmaceutical Sciences, 2012;7(5)
School of Pharmacy and Pharmaceutical Sciences
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Liquid chromatographic analysis of photodegradation kinetics of dapsone in pharmaceutical formulations.

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Background and Aims: The present study was designed to explore the photodegradation kinetics of dapsone, an old synthetic sulfone with innovative use in dermatology, in pharmaceutical preparations.
Methods: The analyses of the degraded samples were performed by an improved ecofriendly and stability-indicating liquid chromatographic method. The degradation was carried out in aqueous solutions of topical preparations in quartz cells under UVC light at 254 nm and sunlight. The kinetics parameters, such as order of reaction, rate constants, half-life (t(1/2)), and the time when 90% of the drug original concentration was left, were determined in former condition.
Results: The drug exhibited a similar degradation process in both irradiation experiments affording a predominant photoproduct with a UV spectrum quite different from that of dapsone. The photodegradation of dapsone in aforementioned solutions shows a zero-order kinetics under UVC light at 254 nm. The obtained results confirm the reliability of the chromatographic method for determining the kinetics run of dapsone in the presence of its degradation products. The present study reveals the photolability of the drug in solution. Thus, appropriated photoprotection is recommended during the manipulation of the drug.

Keywords: Dapsone; Kinetics; Photodegradation