Photolysis of NSAIDs. I. Photodegradation Products of Carprofen Determination by LC-ESI-MS

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Abstract

A solution of carprofen in methanol at a concentration of 2.74 x 10(-2) mg/mL is subjected to photoirradiation using a Hanovia 200-W high-pressure Hg lamp for 9 h. In total, seven photodegradation products are separated, and their quasimolecular ions are subsequently determined online using a liquid chromatography (LC)-electrospray ionization (ESI)-mass spectrometry (MS) method. The high-performance LC consists of an Inertsil 5 ODS-80A (2.1- x 150-mm) column. The mobile phase is initially CH(3)CN. NH(4)OAc (20mM in de-ionized H(2)O) is 43:57 (v/v), and after 14 min it is CH(3)CN. NH(4)OAc (20mM in de-ionized H2O) is 54: 46 (v/v). The UV detector was set at 260 nm. The parameters of LC-MS for mass determination involves an atmospheric pressure ionization electron spray interface with a negative mode of polarity (ESI(-)). The chemical structures of the degradants are elucidated based on the mass-to-charge ratio of the quasimolecular ions and the molecular weight changes by comparison with the parent drug (carprofen). The degradation proceeds via an initial dechlorination. A dechlorination or esterification reaction is competed with decarboxylation. This finding is in accordance with our previously reported result of first order photodecomposition kinetics for carprofen.