26th Congress of SCTM

Sept. 20-23, 2023, Metropol Lake Resort, Ohrid, N. Macedonia

A Systematic Study of Esterification of Ibuprofen with Common Alcoholic Excipients using LC-MS/MS

V. Jakimovska Pokupec,[a,b] M. Stefova,[b] and Gj. Petrushevski[a]

[a] *Alkaloid AD, Skopje, RN Macedonia*

[b] *Institute of Chemistry, Faculty of Natural Sciences and Mathematics, University "Ss. Cyril and Methodius", Skopje, RN Macedonia*

**vjakimovska@alkaloid.com.mk*

Ibuprofen is a nonsteroidal anti-inflammatory drug with non-narcotic, analgetic and antipyretic action. It is widely used in the treatment of pain in many different pharmaceutical preparations. The usage of alcohols as excipients is known in topical preparations to increase the solubility of ibuprofen, as well as to enhance its skin permeability. Because of the chemical nature of ibuprofen, reaction of esterification in the presence of alcohols is expected to occur in such preparations and the products should be identified and their concentration monitored.[1]

In this work, a systematic study has been carried out focused on the esterification reactions between ibuprofen and simple alcoholic excipients with different structural complexity: ethanol, isopropanol and propylene glycol. The detected products have been separated with an optimized reversed-phase chromatographic method and characterized with mass spectrometry.[2] The developed LC-MS method has enabled structural characterization of the ester of ibuprofen with ethanol and with isopropanol as well as two monoesters and one diester of ibuprofen with propylene glycol obtained in the stressed binary mixtures by their MS and MS^2 spectra.

Keywords: Ibuprofen, alcohol, ester, drug, API, excipient, LC-MS/MS

References

1. Douša, M.; Meca, L.; Gibala, P.; Jirman, J.; Tkadlecová, M.; Srbek, J.; Šalandová, J.; Kovalčíková, E.; Břicháč, J. Esterification of ibuprofen in soft gelatin capsules formulations-identification, synthesis and liquid chromatography separation of the degradation products, *J. Chromatogr. Sci*. **2017**, 55(8), 790–797. DOI: 10.1093/chromsci/bmx036

2. Farias, F. F.; Martins, V. A. P.; Dorr, F. A.; Trujillo L. M.; Pinto, E. Forced degradation study and characterization of main impurities of ibuprofen soft gelatin capsules by LC-MS-QTOF, *Pharmazie*. **2021**, 76(4), 138–144. DOI: 10.1691/ph.2021.0126