EuroSciCon

European Congress on

Pharma

August 13-14, 2018
Paris, France

Noha Ibrahim Shaaban et al., Am J Pharmacol Pharmacother 2018, Volume 5
DOI: 10.21767/2393-8862-C1-003

APPLYING GREEN ANALYTICAL CHEMISTRY FOR DEVELOPMENT OF A VALIDATED SPECTROFLUORIMETRIC METHOD FOR DETERMINATION OF MOXIFLOXACIN USING THE EXPERIMENTAL DESIGN APPROACH FOR SCREENING AND OPTIMIZING FACTORS AFFECTING ITS NATIVE FLUORESCENCE

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The experimental design was applied for studying and optimizing the different variables affecting the native fluorescence intensity of moxifloxacin using spectrofluorimetric method. The method was divided into two phases. The first phase is a pilot stage; a full factorial design was used in order to screen four independent factors and the interaction between them: temperature (°C) X1, degassing time using the ultrasonicator (min) X2, pH X3 and phosphate buffer concentration (mM) X4. And the interaction between ((X1, X2), (X1, X3), (X1, X4), (X2, X3), (X2, X4), and (X3, X4)). From the four factors only temperature (°C) and pH were identified as significant using analysis of variance. The aim of the second phase is to optimize the method's performance using central composite face-centered design (CCF). It was found that the optimum conditions of temperature and pH were 7.4°C and 9.7, respectively. Linearity was observed over the range of 5-40 ng/mL and the detection limit was 0.9 ng/mL. The optimized method was successfully validated according to the International Conference on Harmonization (ICH) guidelines. Placket-Burman design was used for method robustness. The method was successfully implemented for the determination of the commercial tablets with a recovery of 99.64% and a relative standard deviation of 1.33 %.

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