ABSTRACT

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Analytical assessment of selected drugs using the UHPLC I

Thesis

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The aim of this work has been to develop an analytic method for the evaluation of sobuzoxane, ICRF-154, and dexrazoxane using UHPLC-UV. Furthermore to verify the linearity of various sobuzoxane concentrations for quantitative evaluation, test of the stability of sobuzoxane in a working solution, and examine sobuzoxane in acid/base stress tests.

UHPLC-UV method with gradient elution was developed for the analysis of sobuzoxane, ICRF-154, and dexrazoxane. Analyte separation was achieved using a Zorbax-Aq rapid resolution HT chromatograpjic column (3 mm x 100 mm; 1,8 μm). Methanol and 2 mmol/l ammonium formate acidified to pH 4 with formic acid were used as the mobile phase at following gradient 0 min - 4,5 min 20 % methanol, 4,5 min - 8 min 80 % methanol, 8 min - 11 min 20 % methanol. Analytes were recorded using a UV detector set at a wavelength of 254 nm. Linearity of the method for sobuzoxane was verified in the range (50 μg/ml - 400 μg/ml) using linear regression. The developed method was used to test stability of sobuzoxane in a working solution during analysis and under acid/base stress conditions.

The original goal of analyzing one working solution containing all of three substances could not be performed due to differences in solubility of all compounds in methanol. Two working solutions were prepared as follows: sobuzoxane with dexrazoxane and ICRF-154 with dexrazoxane. Analysis proceeded under the same conditions for both solutions. The linearity of sobuzoxane was verified through linear regression, with a determination coefficient of $R^2 = 0.9997$. Sobuzoxane's stability was sufficient for the working solution, and results did not differ by more than 1.46 %. A sobuzoxane solution with an acid addition remained stable for 3 hours. Base stress led to degradation immediately after preparation, suggesting sobuzoxane unstability in alkaline solutions.

This method was used for the purpose of pilot measurements. An opportunity for optimization and subsequent validation, and potentially also conversion to UHPLC-MS is presented, in order to increase the sensitivity of the method.