1. Summary

The aim of this study consisted in the development and validation of a bioanalytical method for the identification and determination of dimefluron and its metabolites in biomatrices. For the purposes of this study, six expected potential dimefluron metabolites were prepared and identified by NMR and MS. Higher homologue of dimefluron (homodimefluron) was selected and synthesized as an internal standard.

The chromatographic columns with various types of the stationary phases were tested. The best results were achieved using a pentafluorophenylpropylsilyl silica gel column rinsed with the mobile phase of acetonitrile-phosphate buffer pH = 3 in a gradient mode.

After the validation of the bioanalytical method, this chromatographic system was applied to the disposition study of dimefluron in rats. After an intragastric administration of dimefluron to rats, samples of urine and faeces were collected each 24 hours. The elimination of dimefluron and its phase I and phase II metabolites in urine and faeces was studied. Maximum concentrations of dimefluron derivatives in the excrements were found in the time interval of 24 - 48 hours after the administration. 9-*O*-Desmethyldimefluron and 3-*O*-desmethyldimefluron were the principal metabolites found in the rat faeces, while the metabolic products of *N*-desmethylation, *N*-oxidation and carbonyl reduction were found in lower concentrations.

Some unknown peaks in chromatograms were identified as further minor metabolites of dimefluron. The survey of dimefluron biotransformation was suggested from the obtained results.

The metabolites of phase II biotransformation were searched in urine.

The 3-*O*-desmethyldimefluron glucuronide and C_7-reduced 3-*O*-desmethyldimefluron glucuronide were identified as phase II metabolites in urine.