Abstract

In the recent years, many new substances have appeared in the drug market, which are abused for their psychoactive effect. It is used as an alternative to classical drugs (heroin, cocaine, ecstasy ect.) due to their legal status. The great concern is ineffectiveness of the current methods of toxicological screening of biological samples to identify these new compounds.

The aim of my diploma thesis was to receive or expand knowledge of chemical properties of 10 standards of new psychoactive substances and its metabolites using MS/MS. Conditions for creation of precursor ions in ion source, optimization of conditions of transport of these ions to the ion trap and optimization of condition of fragments creation in the ion trap were optimized. Subsequently, fragmentation of these ions was studied systematically. Characteristic losses of neutral molecules were determined for each group of these substances which can increase the sensitivity of this method. After that, mephedrone was chosen for detailed study including the study of its metabolites using LC-MS/MS. Standard of mephedrone, spiked urine sample with mephedrone and rat urine dosed with mephedrone were studied. Mephedrone and some its metabolites were identificated in this urine sample.

Information received from the investigated substances can be used for analysis of patient urine samples in cooperation with the Institute of Forensic Medicine and Toxicology, LF 1