

Abstract

This bachelor thesis is focused on the spectral analysis of combustion and thermolytic products of selected addictive substances. Spectral analyzes of smoke of various tobacco products (cigarette, electronic cigarettes, hookah) were performed in order to qualitatively determine the composition of smoke and compare the harmfulness of individual types. The main objective was to determine whether the electronic cigarettes are less harmful to health in terms of the composition of the main products detectable by high-resolution spectroscopy occurring in gas-phase smoke. Furthermore, the work deals with a more detailed analysis of drug thermolysis in a wider temperature range and repeatability of measurements over a longer period of time. New spectral single crystal radiation sources from Crytur were also used to measure absorption spectra and their applicability in the field of overtone spectra was tested. All these measurements were performed using Fourier transform infrared spectroscopy (FTIR). For tobacco products, less compounds were detected in electronic cigarettes and hookahs than in conventional cigarettes. In the case of drugs, we were able to confirm the repeatability of measurements and determine the percentage of individual substances at different temperatures. Furthermore, the applicability of drug measurements by thermolysis and subsequent analysis by FTIR was demonstrated in practice. Next, it was found that the new single crystal spectral sources are sufficiently stable for spectroscopic measurements, however, in terms of their intensity and range, further technical development will be necessary.

Keywords

Tobacco products

Electronic cigarettes

FTIR

Drugs

Drug thermolysis

Single crystal sources