

## **Abstract**

Dissertation is dealing with the development of methods of quality control of alcoholic products, particularly, with quantification of volatile congeners. Previously suggested “Ethanol as internal standard (IS)” method was compared with existing analytical methods of internal and external standardisation. After satisfactory results the method was validated in one laboratory and then an inter-laboratory study which included nine laboratories from four countries was conducted. It was shown that the method usage on GC-FID is beneficial due to the absence of necessity of internal standard compound addition into tested sample, and absence of tedious sample alcohol by volume (ABV) or density measurements.

The algorithm of the method usage on GC-MS instruments was also suggested and developed. It was found out that MS detector sensitivity should be reduced in order to register ethanol signal successfully. For this aim it was suggested to employ less abundant 47 m/z ions during ethanol elution. These ions correspond to non-fragmented ethanol molecules containing one heavy isotope, mainly  $^{13}\text{C}$ . According to the obtained results the suggested methodology allowed employing the “Ethanol as IS” method on GC-MS instruments with metrological properties better or similar as for the traditional IS method. The method was also tested by analysing 36 real alcoholic samples.

The variation of IS method calibration factors was also studied. Calibration factors were obtained for both suggested and traditional IS methods under different instrument conditions and solution properties. Possible reasons of non-linearity of GC-MS calibration factors were discussed.