

**CHARLES UNIVERSITY**

**Faculty of Science**

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Study programme: Analytical chemistry



**Anton Korban, M.Sc.**

Development and metrological evaluation of gas chromatographic methods for quality and safety control of alcoholic products

Vývoj a metrologické hodnocení metod plynové chromatografie pro kontrolu kvality a bezpečnosti alkoholických výrobků

Doctoral thesis

Supervisor: Assoc. Prof. Radomír Čabala, Ph.D.

Prague, 2022

## List of publications and conference papers

### *Publications:*

1. Charapitsa, S., Sytova, S., Korban, A., Boyarin, N., Shestakovich, I. & Cabala, R. (2018). The establishment of metrological characteristics of the method “Ethanol as Internal Standard” for the direct determination of volatile compounds in alcoholic products. *Journal of Chemical Metrology*. 12(1), 59-69.  
<https://doi.org/10.25135/jcm.14.18.02.063>
2. Charapitsa, S., Sytova, S. Korban, A. & Sobolenko, L. (2019). Single-Laboratory Validation of a Gas Chromatographic Method of Direct Determination of Volatile Compounds in Spirit Drinks: Need for an Improved Interlaboratory Study. *Journal of AOAC International*. 102(2), 1-6. <https://doi.org/10.5740/jaoacint.18-0258>
3. Charapitsa, S., Sytova, S., Korban, A. et al. (2019). Interlaboratory study of ethanol usage as an internal standard in direct determination of volatile compounds in alcoholic products. *BIO Web of Conferences*. 15.  
<https://doi.org/10.1051/bioconf/20191502030>
4. Cherepitsa, S.V., Sytova, S.N., Egorov, V.V., Leshchev, S.M., Korban, A.L., Sobolenko, L.N., Milochkin D.A., Ustyugov, V.S., Korobov, V.A. & Ismagilov, D.R. (2019). Validation of the Method of Direct Determination of the Quantitative Content of Volatile Components in Alcohol Containing Products. *Beer and Beverages – Pivo i Napitki*. 4, 41-45. <https://doi.org/10.24411/2072-9650-2019-10005>
5. Korban, A, Charapitsa, S, Cabala, R, Lidia & S, Sytova, S. (2020). The perspectives of ethanol usage as an internal standard for the quantification of volatile compounds in alcoholic products by GC-MS. *Journal of Mass Spectrometry*. 55.  
<https://doi.org/10.1002/jms.4493>
6. Charapitsa, S., Sytova, S., Korban, A., Sobolenko, L., Egorov, V., Cabala, R., Yilmaztekin, M. & Cabaroglu, T. (2020). Interlaboratory study of the method for direct determination of volatile compounds in alcoholic products using ethanol as internal standard. *Journal of Belarusian State University. Chemistry*. 1. 74-87.  
<https://doi.org/10.33581/2520-257X-2020-1-74-87>
7. Korban, A., Charapitsa, S., Cabala, R., Sobolenko, L., Egorov, V. & Sytova, S. (2020). Advanced GC-MS method for quality and safety control of alcoholic products. *Food Chemistry*. 338, 1-4. <https://doi.org/10.1016/j.foodchem.2020.128107>

8. Korban, A., Čabala, R., Egorov, V., Bosáková, Z., & Charapitsa, S. (2022). Evaluation of the variation in relative response factors of GC-MS analysis with the internal standard methods: Application for the alcoholic products quality control. *Talanta*, 246. <https://doi.org/10.1016/j.talanta.2022.123518>
9. Korban, A., Čabala, R., Egorov, V., Charapitsa, S., Bosáková, Z., & Sytova, S. (2022). Fluctuation of internal standard method calibration factors based on a Taguchi designed experiment while alcoholic products analysis with GC – MS. *Monatshefte Für Chemie - Chemical Monthly*, (0123456789). <https://doi.org/10.1007/s00706-022-02942-8>

**Conference papers:**

1. Korban, A. & Makhomet, A. (2016, September 19-21). Expansion of the new method “Ethanol as Internal Standard” for direct determination of volatile compounds in the spirit products. 12th International Students "Modern Analytical Chemistry" Conference, Prague, Czech Republic.
2. Charapitsa, S., Sytova, S., Korban, A. et al. (2017, April 4-5). Novel method for direct determination of the volatile compounds in alcohol products. International "Metrology-2017" conference, Minsk, Belarus.
3. Charapitsa, S., Sytova, S., Korban, A. et al. (2017, April 4-5). Prospects for creating standard solutions of volatile compounds in alcohol-containing products. International "Metrology-2017" conference, Minsk, Belarus.
4. Charapitsa, S., Sytova, S. & Korban, A. (2017, Mai 19-20). Correct quantification of complex water-ethanol mixtures. 5th Republican "Analytical Chemistry of RB - 2017" conference, Minsk, Belarus.
5. Charapitsa, S., Sytova, S. & Korban, A. (2017, Mai 19-20). The validation of the method of direct quantification of volatile compounds in alcoholic products with the usage ethanol as an internal standard. 5th Republican "Analytical Chemistry of RB - 2017" conference, Minsk, Belarus.
6. Korban, A. (2017, September 21-22). The numerical method for calculation of the quantitative composition of complex water-ethanol solutions. 13th International Students "Modern Analytical Chemistry" Conference, Prague, Czech Republic.