**IL21 CALIBRATION STRATEGIES FOR QUANTITATIVE LASER ABLATION – ICP-MASS SPECTROMETRY (LA-ICP-MS) ANALYSIS OF CATALYST SAMPLES.** **Ana Rua-Ibarz**, Thibaut Van Acker and Frank Vanhaecke, Ghent University, Department of Chemistry, Atomic & Mass Spectrometry – A&MS research group, Campus Sterre, Krijgslaan 281-S12, 9000 Ghent, Belgium; Marina Boccongelli, TotalEnergies Research & Technology Feluy, Zone Industrielle C, B-7181 Feluy, Belgium; Ahmad Al Farra, TotalEnergies Research & Technology Gonfreville, BP 27, 76700 Harfleur, France; Ana.RuaIbarz@UGent.be

In petrochemistry, the determination of elements present at trace levels in some materials, including catalysts, is of particular interest because of the important economic stakes involved. The catalysts are especially important in this context because they play a key role in petroleum refining. However, the catalyst samples are difficult to mineralize for conventional solution-based ICP-MS analysis, and thus, the use of LA-ICP-MS can be seen as a potential alternative. Nowadays, LA-ICP-MS is one of the most important techniques for elemental and isotopic analysis of solid samples. However, the major analytical problem for quantitative LA-ICP-MS analysis is the selection of an appropriate calibration strategy due to the important matrix effects affecting this technique, and the lack of suitable certified reference materials (CRMs) with a matrix composition similar to that of the samples and containing the analytes of interest at adequate concentration levels.

In this presentation, different calibration strategies for quantitative LA-ICP-MS analysis of catalyst samples will be discussed and the figures-of-merit of each of the approaches tested will be evaluated. In this context, a traditional method relying on external calibration (EC) in combination with internal standardization (IS) using commercially available CRMs was considered the reference approach. The results thus obtained were compared to those obtained by means of two newly developed calibration strategies: (1) a multi-signal calibration approach [1] and (2) a solution-based calibration approach [2]. The first approach relies on monitoring signal intensities obtained under different LA settings (e.g., repetition rate and spot size), while the second is based on an adequate mixing of liquid calibration standards with the ablated material.

After a systematic comparison of the results obtained for quantitative LA-ICP-MS analysis of catalyst samples, the advantages and disadvantages of the different approaches will be discussed, aiming at selecting the best suited calibration strategy for straightforward quantitative LA-ICP-MS analysis.

[1] G. L. Donati, R. S. Amais, *J. Anal. At. Spectrom.*, **34,** 2353 (2019).
[2] L. Michaliszyn, T. Ren, A. Rothke, O. Rienitz, *J. Anal. At. Spectrom.*, **35,** 126 (2020).