STUDY AND COMPARISON OF A NEW SUBSTRATE COMPATIBLE WITH μFTIR AND μRAMAN

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Abstract

In the microplastics science field, the Fourier-Transform InfraRed microspectroscopy (μFTIR) and Raman microspectroscopy (μRaman) are the most commonly employed spectroscopic techniques. However, the analytical protocols so far developed usually focus on only one technique and aim at providing samples optimized for the chosen instrument. Consequently, two analytical runs have to be conducted separately and the results may be difficult to relate to each other. Moreover, additional pre-analytical work is required, from sampling an adequate number of replicates to preparing the samples and, finally, data post-processing. Finding a non-responding, easy-to-handle, and cheap substrate compatible with both techniques would solve these drawbacks, enabling spare workforce and analytical time. UNS SS30400, the common stainless steel, is a promising candidate and was already employed with the μRaman by Lewis et al. (2016) for the analysis of tissues and cells. The present work aims at applying this material to the μFTIR analysis of microplastics by developing a new analytical protocol in reflection mode. In addition, the substrate's performance with both techniques is compared with that of 1 μm single-crystal Silicon (Si) filters and 0.8 μm gold-coated poly(carbonate) (Gold-PC).

Keywords: Raman microspectroscopy, FTIR microspectroscopy, microplastics quantification, microplastics

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