Variations between odorous VOCs detected by assessors via gas chromatography coupled with mass spectrometry and olfactory detection port (ODP) system

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Abstract

Odorous VOCs were analysed via a thermal desorption gas chromatography coupled with mass spectrometry and olfactory detection port (TD-GC-MS/ODP) system in order to characterise emissions from wastewater treatment plant. Three trained ODP assessors complying with panellists requirements, according to European Dynamic Olfactometry standard (EN: 13725), were used for the olfactory analysis. However, their sensitivity to n-butanol varied, within the acceptable limits. The ODP assessors analysed sorbent tubes, taken in triplicate, used to sample odorous VOCs. Intensities of odorous VOCs detected using ODP were scaled from 1 to 4 (with 1 being the weakest and 4 the strongest odour intensity). The ODP assessors used their own odour descriptors, based on their own experience as well as referenced descriptors on published compost and wastewater odour wheels. All odour stimulus chromatograms were recorded using the recorder software. The ODP assessors detected 33 different odorous VOCs, however the intensities assigned by each assessors to particular VOCs varied. Moreover, some of odorous VOCs were not detected by all assessors. For example, geosmin was detected by only two of them. The use of GC-MS/ODP system for the analysis of odorous VOCs is valuable when analysed by different assessors, allowing a range of responses to specific odorants in a populations to be investigated.