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ABSTRACT

LABORATORY AND FIELD STUDY ON THE ANALYSES OF SILOXANES IN BIOGAS BY TD-GC-MS

Ing. Dooms Elisabeth – Wondelgemkaai 159, 9000 Ghent, Belgium (OLFASCAN)
Dr. Haerens Kurt – Wondelgemkaai 159, 9000 Ghent, Belgium (OLFASCAN)
Ir. Calder Hannah – Gwaun Elai Medi-Science Campus, Llatrisant, UK (Markes International Ltd)

There is increasing interest in the usage of biogas produced from wastewaters, anaerobic digesters and landfill sites as a source of green energy. Biogas generated from these types of sites require process monitoring due contamination with siloxanes derived from hygiene products, detergent, antifoams, etc. Siloxanes are troublesome impurities in biogases in engine sources. The combustion of biogas can lead to deposits of silicon dioxide particles which can cause problems and damage different kind of gas engines or turbines through their build up and via corrosion.

The objective of this study was to develop a method on a thermal desorption unit coupled to a gas chromatography and mass spectrometer (TD-GC-MS) to identify and quantify siloxanes present in a representative biogas sample with a low detection limit (µg/m^3). Enabling the occurrence of siloxanes in a biogas matrix and efficiency of the removal processes present in the industry to be monitored.

In collaboration with MARKES INTERNATIONAL, a method on the TD-GC-MS was evaluated with analytical standard over a range of 10 – 1000 µg/mL prepared in methanol. To retain the different kinds of heavier molecules in the best manner, different adsorption tubes were monitored. In addition, the most common sampling methods were evaluated in the OLFASCAN laboratory and in the field to analyse the shelf life of siloxanes in these receptacles and to determine the interference of siloxanes with other compounds present in the biogas matrix. Canisters, sampling bags and direct adsorption on adsorption tubes were tested taking into account the high level of humidity in biogas samples.

Indicate preference of kind of presentation

- ¤ Oral Communication
- ☐ Poster

Indicate topic of your work for the conference:

- ☐ Policy and associated regulations for odour and air quality.
- ¤ Odour/VOC measurement, monitoring&sensor technologies.
- ☐ Odour/VOC perception, impact, formation and dispersion.
- ☐ GHG emissions particulate matter and industrial emissions.
- ☐ Source characterization and odour/VOC mapping.
- ☐ Odour/VOC abatement, mitigation and neutralization.
- ☐ Odour/VOC from waste water, sewer systems and livestock.
- ☐ Air emissions and sustainable solutions for waste handling
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- ☐ Other (suggest a new topic):

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