

Biofiltration of odorous gases emitted from high-temperature processing of animal by-products.

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Keywords: rendering, animal by-products processing, odorous gases, biofiltration

A rendering process is defined as a process using high temperature and pressure to convert whole animal and poultry carcasses or their by-products with no or very low value to safe, nutritional, and economically valuable products. Remaining odorous gases (direct-fired meal dryers and workshops) can then be transferred to a biofilter bed constructed of materials such as concrete and layered products such as compost, coarse gravel, pinebark, and woodchips.

In the present study, the functional stratification of an experimental semi-industrial biofilter fed with an industrial gaseous effluent was thoroughly investigated by assessing the relative abundances of waste gas compounds using gas chromatography–mass spectrometry (GC-MS) and by quantifying sulphured compound concentrations (H₂S, methylmercaptan, dimethylsulphide, dimethyldisulphide (DMDS)) using gas chromatography. The study focuses on sulphured compounds since these volatiles have been identified as predominant odorants in the emission of a wide range of activities in bio-industry such as rendering plants.

To improve process design and scale-up of gas biofilters, a thorough understanding of compounds degradation mechanisms within model engineering biofilters is needed. The aim of this study is then to investigate the spatial distribution of pollutants removal within an experimental semi-industrial biofilter fed with industrial emissions from a rendering plant.