

RESUMEN

CONFERENCIA SOBRE OLORES EN EL MEDIO AMBIENTE, 23-24 NOVIEMBRE BILBAO 2015

DEODORIZATION OF A GAS STREAM CONTAINING SULFUR COMPOUNDS WITH IRON NANOPARTICLES

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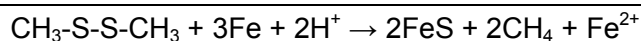
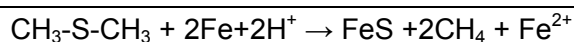
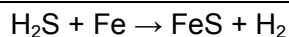
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One of the main odor problems in wastewater treatment plants is caused by biosolid digestion during anaerobic decomposition of organic matter. Within odorous compounds are organic sulfur compounds as mercaptans, sulfides and hydrogen sulfide, which are unpleasant at odor threshold concentrations as low as 0.1 ppb. Conventional methods are not totally effective for the elimination of mercaptans or sulfides.

Engineered nanomaterials have found increasing applications in environmental technologies owing to their superior reactivity towards a wide variety of contaminants. Due to their high reductant capacity, affinity towards elemental sulfur, low price and low toxicity, zero-valent iron nanoparticles (nZVI) present a novel approach to odor abatement. Several studies have demonstrated their effectiveness for the detoxification of contaminants as diverse as chlorinated solvents, pesticides, metals, azo dyes and PCBs.

The aim of this work was to study the elimination of sulfur compounds in a gas stream using a nZVI suspension. The reactions between nZVI and sulfur compounds produce hydrogen or methane, which are odorless compounds, and FeS, which is a solid not soluble in water.



Iron nanoparticles were synthesized by the reductive precipitation method. Materials tested where standard iron nanoparticles, nZVI doped with Cu, Ni and Pd and nZVI encapsulated by carbon spheres.

This study has demonstrated a high reductant capacity of dimethyl disulfide by nZVI doped with Ni. On the other hand, encapsulation of nZVI enhanced the stability and avoided aggregation of nZVI without significantly sacrificing activity.

Indicar la preferencia de tipo de presentación

- ☒ Comunicación oral
☐ Póster

Indicar la sesión en la que los autores proponen presentar su trabajo:

- ☐ Sesión I. Formación de olores en el medio ambiente y emisión.
☐ Sesión II. Legislación sobre olores y Autorizaciones Ambientales Integradas.
☐ Sesión III. COVs y medidas de olor.
☐ Sesión IV. Sensores electrónicos para la detección de gases y olores. Modelos de dispersión de olores.
☐ Sesión V. Percepción de olores e impacto por olores. Olfatometría.
☒ Sesión VI. Técnicas para el control de olores.

El comité científico podrá revisar el tipo de presentación y la sesión en la que los autores proponen incluir su trabajo.

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