

## **Water Science and Technology**

### **Biological regeneration of ferric (Fe<sup>3+</sup>) solution during desulphurisation of gaseous streams: effect of nutrients and support material**

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### **Abstract**

This paper evaluates the biological regeneration of ferric Fe<sup>3+</sup> solution during desulphurisation of gaseous streams. Hydrogen sulphide (H<sub>2</sub>S) is absorbed into aqueous ferric sulphate solution and oxidised to elemental sulphur, while ferric ions Fe<sup>3+</sup> are reduced to ferrous ions Fe<sup>2+</sup>. During the industrial regeneration of Fe<sup>3+</sup>, nutrients and trace minerals usually provided in a laboratory setup are not present and this depletion of nutrients may have a negative impact on the bacteria responsible for ferrous iron oxidation and may probably affect the oxidation rate. In this study, the effect of nutrients and trace minerals on ferrous iron oxidation have been investigated and the results showed that the presence of nutrients and trace minerals affects the efficiency of bacterial Fe<sup>2+</sup> oxidation. The scanning electron microscopy analysis of the geotextile support material was also conducted and the results showed that the iron precipitate deposits appear to play a direct role on the bacterial biofilm formation.