From: Axelrad, Don
To: Frydenborg, Russel; Miller, Denise
Cc: Atkeson, Thomas; gilmourc@si.edu
Subject: FW: Rate and Stoichiometry of SRB Sulfate Reduction
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Denise, Russ,

I meant to point out that here we have a half-saturation coefficient (K_{sul}), of 1.8 mg/l SO4 where K_{sul} corresponds to the concentration at which SRB growth is one-half of its maximum.

Assuming SRB growth rate is directly proportional to MeHg production, a good assumption, at SO4 concentrations broadly found in the Everglades due to SO4 inputs, we'd find increased MeHg production.

Cindy can speak more knowledgably about this, but as Phil Parsons has an interest in supporting in vitro SO4 concentration vs. MeHg production studies with Everglades sediments, we at DEP ought to discuss this internally and with external sulfur scientists, and consider if we should discuss line of research this with Phil.

Don

Article

Factors affecting microbial sulfate reduction by *Desulfovibrio desulfuricans* in continuous culture: Limiting nutrients and sulfide concentration

S. Okabe *, P. H. Nielsen, W. G. Charcklis

Center for Interfacial Microbial Process Engineering, Montana State University, Bozeman, Montana 59717

*Correspondence to S. Okabe, Center for Interfacial Microbial Process Engineering, Montana State University, Bozeman, Montana 59717

KEYWORDS

Desulfovibrio desulfuricans • stoichiomentry • kinetics • microbial sulfate reduction • sulfate limitation • nitrogen limitation • sulfide inhibition

ABSTRACT

The effects of sulfate and nitrogen concentrations of the rate and stoichiometry of microbial sulfate reduction were investigated for *Desulfovibrio desulfuricans* grown on lactate and sulfate in a chemostat at pH 7.0. Maximum specific growth rates (μ_{max}), half-saturation coefficients (K_{sul}), and cell yield ($Y_{c/Lac}$) of 0.344 ± 0.007 and 0.352 ± 0.003 h^{-1}, 1.8 ± 0.3 and 1.0 ± 0.2 mg/L, and 0.020 ± 0.003 and 0.017 ± 0.003 g cell/g lactate, respectively, were obtained under sulfate-limiting conditions at 35°C and 43°C. Maintenance energy requirements for *D. desulfuricans* were significant under sulfate-limiting conditions. The extent of extracellular polymeric substance (EPS) produced was related to the carbon: nitrogen ratio in the medium. EPS production rate increased with decreased nitrogen loading rate. Nitrogen starvation also resulted in decreased cell size of *D. desulfuricans*. The limiting C : N ratio (w/w) for *D. desulfuricans* was in the range of 45 : 1 to 120 : 1. Effects of sulfide on microbial sulfate reduction, cell size, and biomass production were also ivestigated at pH 7.0. Fifty percent inhibition of lactate utilization occurred at a total sulfide concentration of approximately 500 mg/L. The cell size of *D. desulfuricans* decreased with increasing total sulfide concentration. Sulfide inhibition of *D. desulfuricans* was observed to be a reversible process. © 1992 John Wiley & Sons, Inc.

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