

Enrichment of carbon monoxide utilising microorganisms from methanogenic bioreactor sludge

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Conversion of CO is the rate limiting step during anaerobic conversion of syngas (a gaseous mixture mainly composed of CO, CO₂ and H₂). In this work we study the microbial diversity in anaerobic sludge submitted to extended contact to syngas in a multi-orifice baffled bioreactor (MOBB). Methane was the main product resulting from syngas conversion in the MOBB. Enrichment cultures started with this sludge produced methane as final product, but also acetate. 16S rRNA gene analysis revealed a predominance of *Acetobacterium* and *Sporomusa* species in the enrichments. These are homoacetogenic bacteria that might be involved in CO conversion to acetate. Hydrogen was formed as intermediary from CO conversion and likely used by hydrogenotrophs with the formation of methane. Pasteurisation and serial dilutions of stable CO-converting enrichments resulted in a microbial culture dominated by two *Sporomusa* species that are able to use CO as sole substrate.