论文

# 微生物增产煤层气菌种的驯化

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摘要：

采用厌氧培养方法，从厌氧污泥样品中富集出了产甲烷菌群，仅以煤为碳源对其进行驯化，得到了可以利用煤产甲烷的厌氧菌群。研究了该菌种利用煤产气的规律及常规碳源对菌种产气的影响。结果揭示：驯化后菌种对煤的利用能力显著提高，适应期由15 d缩短到6 d；产气量也显著增加。菌种产气具有规律性，产气周期共28 d，可分为3个阶段：适应期、产气期和稳定期。100 mL底物质量浓度为20 g/L的培养液总产气量达到182 mL，气体中的甲烷浓度约为16%。单日产气量呈先增加后减少的趋势，其中15~17 d的产气量最大，达到20 mL/d。菌种可以利用乙酸钠和甲醇产气，乙酸钠对菌种利用煤产气的增加效果更显著。

关键词： 煤层气；产甲烷菌；增产；菌种驯化

# Domestication of microbially enhanced coalbed methane microorganism

Abstract:

A methanogenic strain was obtained from anaerobic sludge.The strain was cultivated anaerobically with coal as solo carbon resource.The methanogenesis regulation of coal consumed by the strain and the influence of conventional carbonaceous substrates on gas production were investigated.It is found that adaptive phase is decreased from 15 days of original strain to 6 days of acclimated strain.The gas production is greatly raised as well.A 28 days' gas production cycle can be divided into three phases，adaptive phase，gas producing phase and stable phase.The total amount of gas produced by 100 mL substrate is 182 mL which comprises 16% methane.Daily gas production increases at the beginning and then decreases.During 15th day to 17th day，gas production reachs the peak amount of 20 mL/day.The strain can also make use of sodium acetate and methanol to produce gas.However，sodium acetate has a better prompting effect on gas production of coal consumed by the strain.

Keywords: coalbed methane；methanogen；increase production；microorganism domestication

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