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Effects of composition of the gaseous phase on the formation of hydrocarbons in Desulfovibrio desulfuricans

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Abstract

Changes in the synthesis of extracellular metabolic products generated by sulfate-reducing bacteria Desulfovibrio desulfuricans grown on a lactate-containing mineral medium in the presence of H2 and CO2 at various volume ratios in the gaseous phase were studied. An increase in the amount of extracellular products synthesized by the bacteria was observed at an H2/CO2 ratio of 3 : 1. High concentrations of molecular hydrogen (80-95%) in the presence of 5-20% CO2 facilitated the synthesis of hydrocarbons (alkanes) whose highest concentrations were produced at an H2/CO2 ratio of 9 : 1. An increase in the initial CO2 concentration in the gaseous phase above 20% increased the amount of oxygenated compounds in the culture.