

// PROCESS FOR THE PRODUCTION OF ALCOHOLS

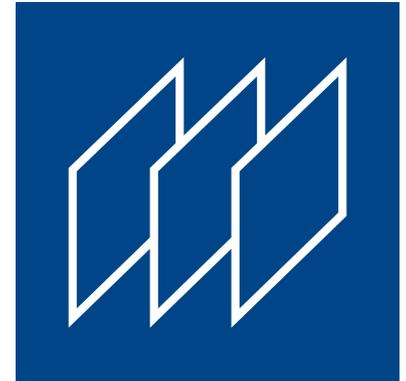
Ref-Nr: TA-B76074

HINTERGRUND

The increased consumption of finite fossil raw materials raises the necessity to find alternatives for the production of basic chemicals and fuels. A sustainable procedure is the gas fermentation, where a synthesis gas (e.g. CO, CO₂, H₂) is converted by microorganisms in a bioreactor. The synthesis gas is available as a by-product of the agriculture, iron-, oil- and chemical industry and can thereby be recycled. Gas fermentation is a relatively new field in the cultivation of - bacteria. In this respect *Clostridium carboxidivorans* is of special interest since it is one of the few acetogenic bacteria which is able to produce longer chained - carbon compounds like butanol and hexanol directly from synthesis gas, besides acetic acid and ethanol.

LÖSUNG

This technology provides an opportunity for product formation where different cell-regulated phases are present by using a cascade of two serially connected stirred-tank reactors. Both reactors are constantly supplied with synthesis gas (CO : CO₂ = 60 : 40). The first reactor is controlled at a pH value of 6 and thereby provides optimal conditions for anaerobic growth of biomass as well as production of acetat and ethanol. A part of the medium containing the bacteria and their products is constantly transferred to the second reactor, where a pH value of 5 is adjusted. In reactor two, cells do not grow anymore and convert acetat in ethanol, butanol and hexanol. This technology provides a de novo synthesis for long-chain alcohols.



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ENTWICKLUNGSSTAND

Prototyp

CATEGORIES

//Chemie

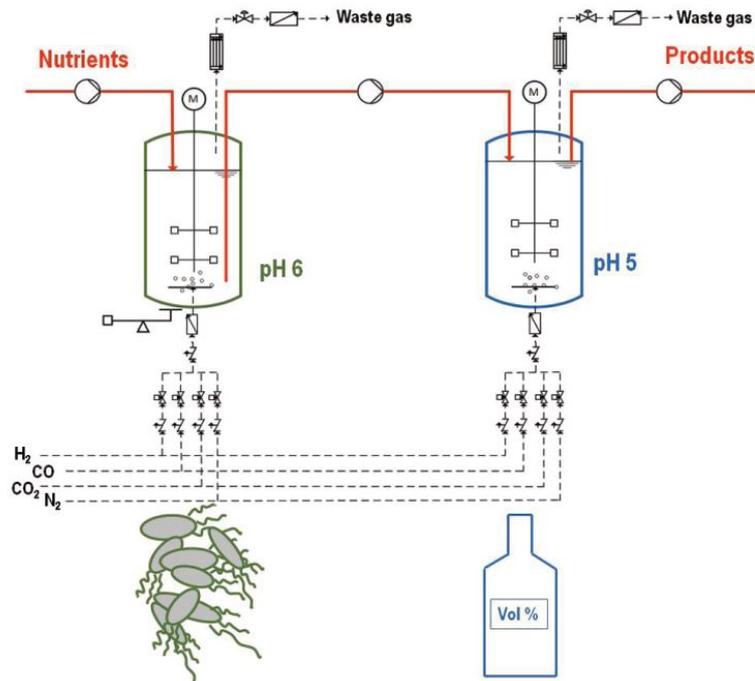


Figure: Schematic representation of two serially connected stirred-tank reactors (reactor 1 with a pH 6 and reactor 2 with pH 5)

VORTEILE

- Utilization for small application as well as for industrial scale up
- Possible adaptation for the production of other bacteria & chemicals