

Production of valuable materials from waste streams by using halophilic microorganisms

Halophiles | recyclable waste | carotenoids | recombinant products | nonsterile process

Halophilic microorganisms are capable of growing on a wide variety of carbon sources in the presence of higher salt concentrations. Industrial waste streams often contain diverse organic matter, which can be recovered to valuable materials by halophilic microorganisms. The novel technology has a strong economic and environmental impact on a broad range of industrial processes. The implementation of a „waste to value“ nonsterile process with halophiles is easy as high salt concentrations ensure low risk of contamination and the recovery of valuable products can be a simple one stage procedure.

Background

Waste streams of diverse industrial processes are often rich in organic carbon. Disposal or recycling is then complex and expensive. The novel technology enhances economic viability of these production processes through process intensification, i.e. waste recycling and use of by-products.

Technology

The technology relies on halophilic microorganisms for the recycling of waste streams. Halophilic microorganisms are capable of growing on a wide variety of carbon sources. They are reported to grow on different organic acids, diverse sugars, the sugar alcohol glycerol and even aromatic compounds, among others. In addition they are producing secondary metabolites like carotinoids or bioplastics and they could even be used for the production of recombinant products. The technology deals with defined medium and - as salt have to be added to the waste stream - with a corrosion resistant bioreactor.



Culture of halophiles in a corrosion resistant bioreactor

- Easy recovery of materials, as disruption of cells can happen automatically in water due to osmotic shock
- The nonsterile process can be implemented in any industrial environment
- Scalability given through defined medium und the use of bioreactor

State of development

Quantitative development of the bioprocess was done for waste streams of different chemical composition, with the identification of parameters which are critical for scale-up.

Potential applications

- Process intensification for industrial waste streams rich in organic carbon
- The process can be coupled with anaerobic fermentation broths like in bio-hydrogen production
- Fully functional also for waste streams with high pH value or salt content

IPR

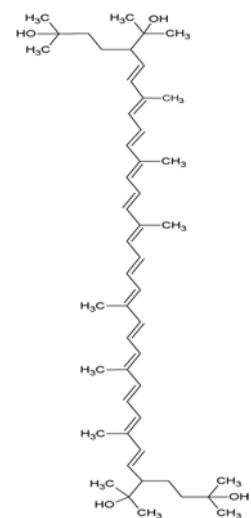
EP-patent granted

Options

License agreement, R&D cooperation

Inventors

E. Martinez
B. Lorantfy
C. Herwig



Bacterioruberin (C50-Carotenoid), a high value product

Advantages

- Halophiles recovering valuables out of diverse industrial waste streams