Docket #: S10-320

Method for the selection of PHB-producing methanotrophic cultures

Researchers in Dr. Craig Criddle's lab have developed a method for enriching microorganisms with high poly(3-hydroxy)butyrate (PHB) production in non-sterile mixed culture conditions. PHB is a carbon storage polymer produced by a wide variety of microorganisms and is useful as a commercial thermoplastic. As environmental concerns increase over the production and disposal of petrochemical-based plastic, there is a growing incentive to produce inexpensive alternatives. PHB may provide such an alternative as it is renewable, rapidly biodegradable and non-toxic. However, conventional processes to produce PHB require pure cultures and costly sterilization procedures and thus are not attractive for large scale production. To overcome these limitations, the inventors have developed a method that reliably selects for PHB producing microorganisms from diverse cultures under non-sterile operational conditions over extended time periods.

Stage of research
The inventors have shown that their method effectively selects for PHB producing microorganisms in non-sterile mixed culture conditions.

Applications

- Bioplastic- alternative to petrochemical-based plastic

Advantages

- No sterilization requirements
- Enables adaptation
- Permits use of mixed substrates
- Does not limit growth rates or selectivity of PHB producing microorganisms

- Low cost
- Well suited for continuous processes and large scale production

Publications

- US Patent Application No. 20130052681
- Criddle, Craig S., et al. Renewable Bioplastics and Biocomposites From Biogas Methane and Waste-Derived Feedstock: Development of Enabling Technology, Life Cycle Assessment, and Analysis of Costs. CA Recylce report. 2014 Aug 27.

Patents

- Published Application: 20130052681
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