



BUILDINGS, CONSTRUCTION & ARCHITECTURE

ENVIRONMENT & SUSTAINABILITY

Method to produce PHAs from OFMSW

CIRCULAR WASTE MANAGEMENT - FOOD WASTE | CIRCULAR WASTE MANAGEMENT - URBAN WASTE | FACILITY & INFRASTRUCTURE MANAGEMENT

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Other

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RESEARCH TEAM | INVENTORS

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The proposed invention describes a process for biosynthesis of Polyhydroxyalkanoates (PHAs) from the organic fraction of domestic solid waste. The method uses mixed microbial cultures (MMCs) and is based on the combination of a three-stage biological process in sequence with a two-step fermented flow filtering system to reduce the concentration of suspended solid particles and nutrients.

Technical Features

The method is adapted to reuse domestic or other organic waste, with a residual solids content greater than 10.0 g/L, as raw material in the production of bioplastics and biogas. The method is based on the combination of a biological process in three sequential phases (Phase I: anaerobic fermentation, Phase II: sequential aerobic fermentation, Phase III: batch aerobic fermentation), with a flow filtering system. After a first filtration of the discharge from Phase I, the flow is divided between the reactor for Phase II, where the biomass is produced and a membrane filter before entering Phase III, where the PHAs is accumulated. This second filtration step reduces the concentrations of particulate matter and nutrients, favoring the synthesis of PHAs.

Link to [information](#) and [article](#) on Ca' Foscari website and to [scientific publication](#).

Possible Applications

- Treatment of Organic Fraction of Municipal Solid Waste (OFMSW) or other fermentable organic waste;
- Production of biogas.

Advantages

- Reuse of organic waste with TSS > 10.0g/L;
- Two different solids removal steps;
- First filtration favors specialized biomass production;
- Second filtration favors maximization of PHAs production.

PATENT OWNERS

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