

Technology #2 Volatile fatty acids from acidogenic digestion of solid biowaste

Description

Volatile fatty acids such as acetic, propionic or butyric acids are known as the “carboxylate platform” or “building blocks” since they are used for many applications in the chemical and petrochemical industry for the production of goods such as plastics, lubricants, paints, etc. Currently, they are mainly obtained from petrochemical resources, but they can be also produced from organic wastes through acidogenic digestion with similar yields and biowaste treatment capacity as anaerobic digestion.

Innovation keys for the environment

- Production of biochemical through sustainable processes.
- Avoid biowaste disposal and associated costs.
- Reducing the dependence from fossil resources.
- Reducing greenhouse gas emission by 70% compared to the oleochemical process and energy consumption by 50% compared to the petrochemical sources.

Biowaste feedstocks

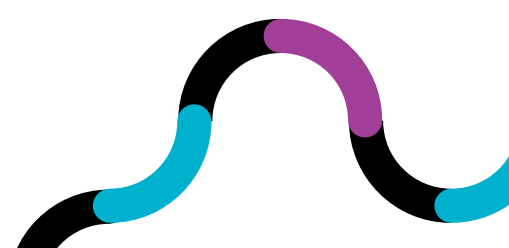
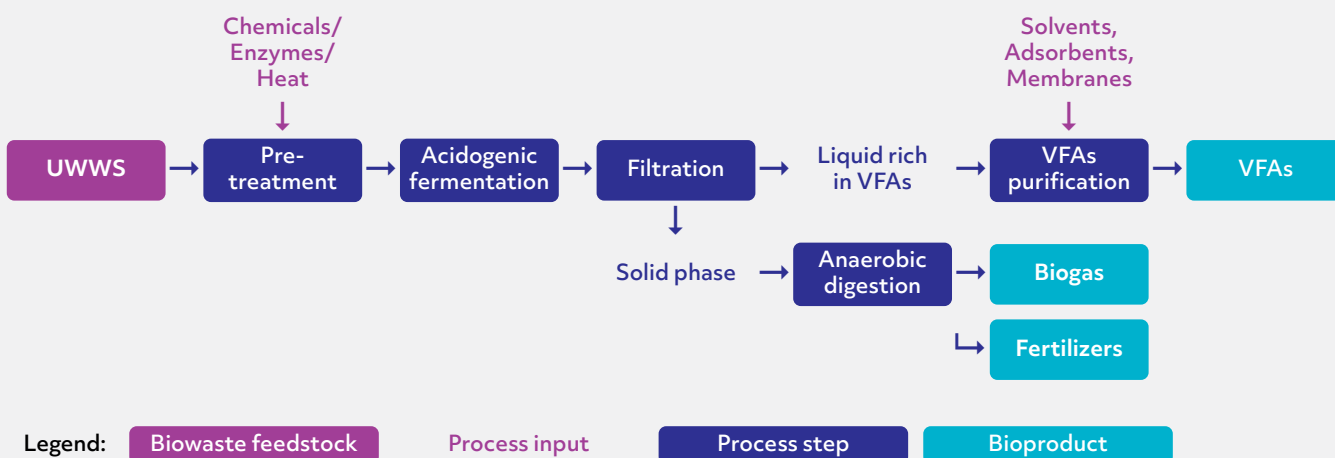
All kind of organic wastes such as urban biowaste, urban or industrial sludges, wastewater sludges or effluents from dairy or fish-canning industries.



Bioproducts

Bioproduct(s)	Market sector	Market price
Acetic acid (solution)	Plastics Lubricants	600-800 €/ton (high concentration)
Propionic acid (solution)	Cosmetics Animal food	1800-2000 €/ton (high concentration)
Butyric acid (solution)		1200-1400 €/ton (high concentration)
VFA mix (solution)	Bioplastics production	500-600 €/ton VFA (VFA in solution 5-8%)

Process flowchart



Existing production plants

	Production plant location	Feedstock	Bioproduct	TRL	Production capacity (ton/year bioproducts)	CAPEX	OPEX
1	Chaincraft Basisweg 68, 1043 AP Amsterdam ⁽¹⁾	Urban biowaste	propionic/butyric/caproic acid	9	>20.000 tons of fatty acids/year	CAPEX> 5 M€	⁽²⁾
2	Ourense WWTP, Spain	Sludge/urban biowaste	acetic/propionic/butyric acid	7	1 ton of VFA/year	CAPEX<1 M€	⁽²⁾
3	Spain - dairy factory	Dairy effluentes	propionic/butyric acids	7	1 ton of VFA/year	CAPEX < 1 M€	⁽²⁾



Acknowledgements

CIGAT Biofactoría
www.umcigat.es/biofactes

Conserval
conservalproject.com

Ecoval
ecoval-sudoe.eu

CiGAT | CENTRO DE INNOVACIÓN GALLEGO DE SISTEMAS AVANZADOS DE TRATAMIENTO DE AGUA
BIOFACTORÍA



Further information

(1) <https://www.chaincraft.nl>

(2) Economically profitable from a VFA production of 5,000 tonnes/year

Carboxylic Acid Market | Size By Product (Acetic, Valeric, Isovaleric, Formic, Propionic, Butyric, Isobutyric, Citric, Caproic, Stearic), By End-User (Food & Beverages, Animal Feed, Personal Care & Cosmetics, Lubricants, Consumer Goods), Industry Analysis Report, Regional Outlook (U.S., Canada, Germany, UK, France, Spain, Italy, China, India, Japan, Australia, Indonesia, Malaysia, Brazil, Mexico, South Africa, GCC), Application Growth Potential, Price Trends, Competitive Market Share & Forecast, 2016 – 2024 (Global Market Insights).



The HOOP project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101000836.

