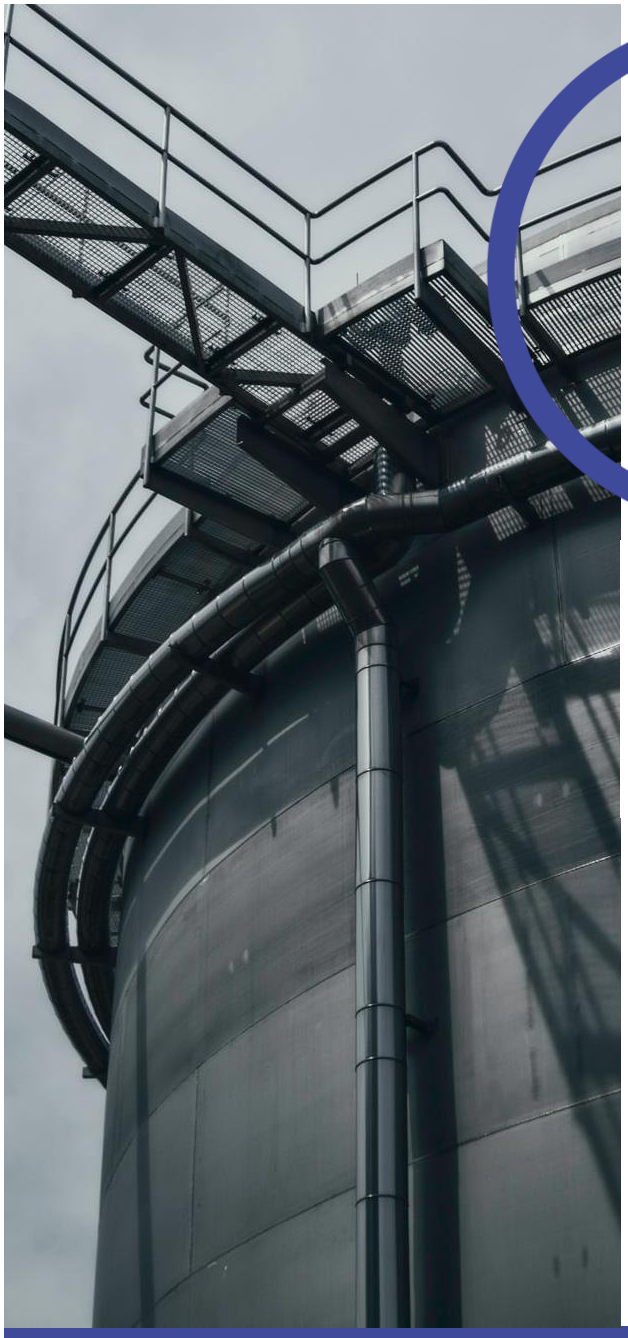


Episode 3

Biodegradability Q&A

OECD 311

What does anaerobic biodegradability mean ?

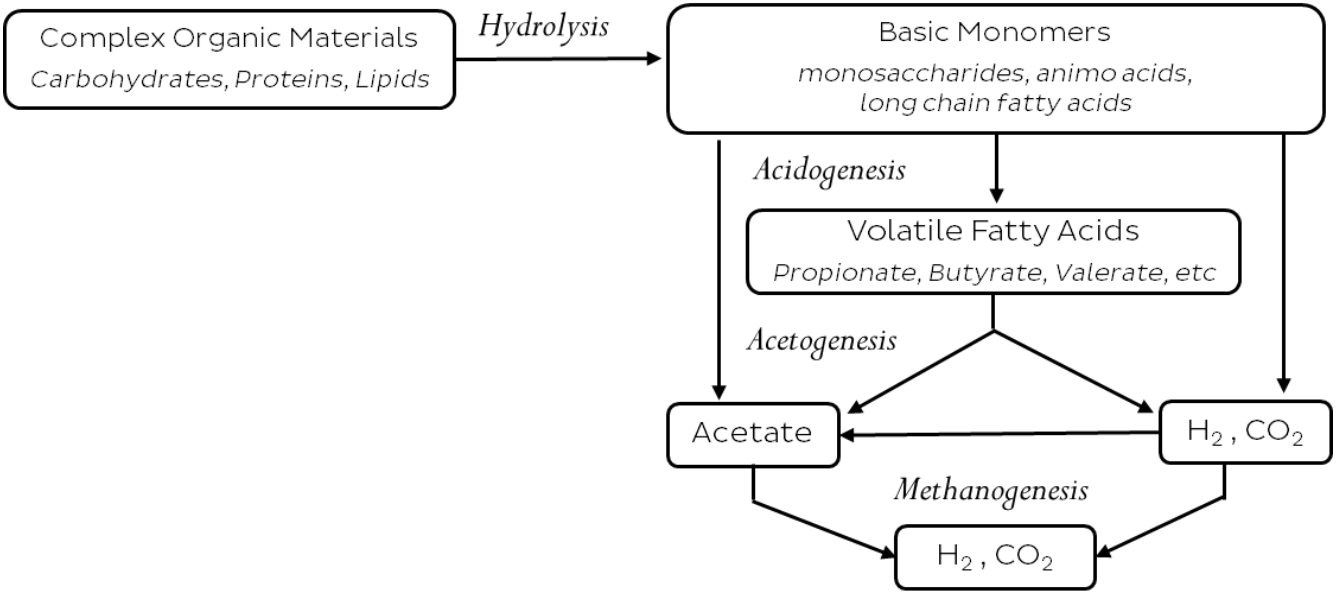
Are you struggling with biodegradability ? As scientists, Scanae designed this Q&A as a tool to share our knowledge and make biodegradability accessible to all of you. Send your question to participate in this Biodegradability Q&A project.

How to participate ? Send us an email

Follow us to receive more information on biodegradability.

What is anaerobic biodegradation ?

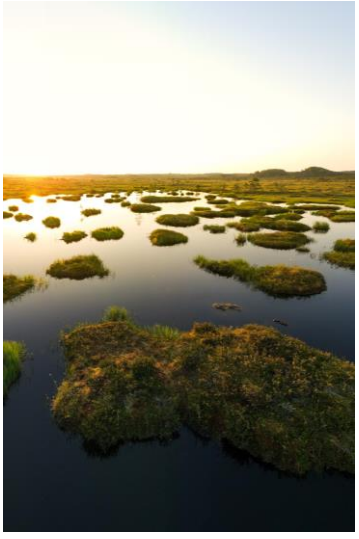
Anaerobic biodegradation refers to biodegradation of organic matter through the joint action of various micro-organisms under oxygen-free (anoxic) conditions.

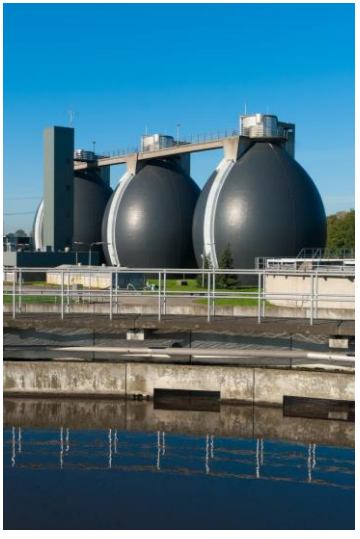


Organic Matter *substance* + H_2O ⟶ CO_2 + CH_4 + **Biomass** *microbial*

Want to know more ? Please contact us.

Where does anaerobic biodegradation happen ?

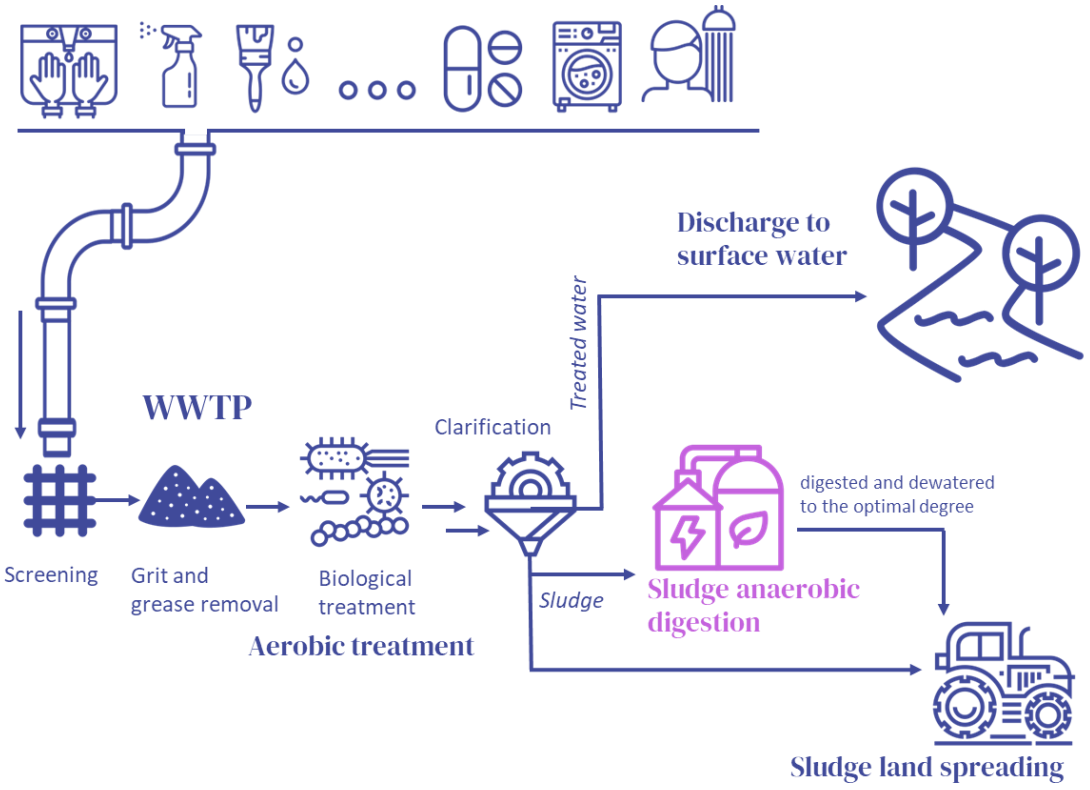


The natural environment is predominantly aerobic, but there are some environmental compartments such as river sediments, subsurface soil layer and anaerobic sludge digesters of wastewater treatment plants which have strictly anaerobic conditions.

Access to the whole Q&A Episode #2 about aerobic screening test

Episode #2 : WWTP
Focus on anaerobic digestion of sludge



In WWTP, the larger fractions of water-insoluble chemicals, as well as of those which adsorb on to sewage solids, are bound to the primary settled sludge, which is separated from raw sewage in settlement tanks before the settled, or supernatant, sewage is treated aerobically. The sludge is then treated to heated digesters for anaerobic treatment.

Methods for anaerobic biodegradability in digested sludge

The test substance, which is the sole added organic carbon in the test, is exposed to diluted anaerobically digested sludge of a relatively low concentration. Biodegradability of the test substance is followed by measurements of the increase in headspace pressure in the closed test vessels resulting from the evolution of CO_2 and CH_4.

	Standards Methods		Test of Polymers
	ISO 11734	OECD 311	ISO 14853
	1995	2006	2005
Degradation parameter	biogas, soluble of inorganic carbon	Biogas, DIC at liquid phase	Biogas, CO_2 and CH_4, DOC, TIC resp. DIC
Test substance	Soluble organic substance	Div. Material	non soluble (polymeric) substance
Medium	Definite mineral salt medium	Definite mineral salt medium	Definite mineral salt medium
Test volume	100 - 1000mL	100 - 1000mL	250mL
Test duration	60d	60d	30-60d
Temperature	35 ± 2 °C	35 ± 2 °C	35 ± 2 °C
Method	manometric	manometric	manometric or volumetric
Concentration test substance	100 mg/L Organic Carbon	20-100 mg/L	100 mg/L Organic Carbon
Inoculum : Dry matter content	1 - 3 g/L	1 - 3 g/L	1 - 3 g/L

Not sure which test is the best for your project, please contact us.

OECD 311 : anaerobic screening test

OECD 311 test guideline describes a screening method for the evaluation of potential anaerobic biodegradability of organic compounds in digested sludge, by measurement of gas production.

End Point : Biogas, DIC at liquid phase

Substance Conc. : High range 100mg/L Organic Carbon

Inoculum : WWTP digested sludge

Test duration : 60d
or until biodegradation has reached a plateau of 60%.

Access to the whole first Q&A Episode

OECD 311 : a test not to be ignored

A stringent screening method

OECD 311 is designed to assess the ultimate anaerobic biodegradability of organic chemicals in heated digesters for anaerobic sludge treatment.

The test is therefore not necessarily applicable to anoxic environmental compartments such as anoxic sediments and soils.

No formal decisions on criteria for anaerobic biodegradability have been made, but, tentatively, 60% of biodegradation has been adopted.

OECD 311 : an underused test

However anaerobic technology may play a key role in the removal of organic substances on WWTP.
Except for surfactants, anaerobic biodegradability is usually missing from chemicals public databases.

A criteria of some eco-labels/regulations and for scientific researches

Surfactants, Polymers, Hydrocarbons, Pharmaceuticals...

SO WHAT'S NEXT

OECD 307 | 308 | 309

Simulation tests,
what are they for ?

Episode 4 – 06/01/2023

scanae
Expert lab in biodegradability

Want to know more ?

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