Biodegradation tests

by AnoxKaldnes

ANOXKALDNES

We are Quality Assured Specialists

AnoxKaldnes offers a unique combination of quality assured tests and deep knowledge of the process microbiology behind the tests. This means that we deliver high quality results that can be used to prove fulfillment of regulatory requirements AND help with interpretation and scaling up of the results. Our laboratory is certified according to ISO 17025 and we can work according to the guidelines of Good Laboratory Practice (GLP).

Applications

- For industries to prove fulfillment of regulatory requirements with respect to use of chemicals or release of wastewater streams to municipal wastewater treatment plants (generally OECD 301 A/F).
- Get approval for use of chemicals according the European chemical regulations REACH. In this case, the test must be performed in compliance with good laboratory practice (GLP), which can be done at AnoxKaldnes laboratory (generally OECD 301 A/F)
- Quantify the refractory part of COD to be used in design calculations (it's often a required input in biological process design calculations) and to determine whether effluent requirements can be reached (generally OECD 302B).
- Control of effluent biodegradability – to see if there is potential for improvement.

Biodegradation Tests – How and Why?

Biodegradation is one of the most important factors in assessing the fate of organic compounds in wastewater treatment plants and in the environment. Biodegradation Tests are tools to quantify the biodegradability of different wastewater streams or specific chemical compounds and the results are important in wastewater treatment design. The tests are also essential in order to prove fulfillment of regulatory requirements, in which case the tests need to be performed by a certified laboratory, such as AnoxKaldnes laboratory.

There are many different standardized Biodegradation Tests to choose from, which can be confusing, so here is a short clarification: The two main differences between the different tests are; (1) whether they test for **ready biodegradability** (Only the easy stuff is degraded – relatively harsh test conditions) or **inherent biodegradability** (Potential ultimate biodegradability – more favorable test conditions with a low ratio of test substance to microorganisms) and (2) the principle of evaluation – either so-called die-away (direct measurement of organic compounds in the water phase) or respirometric (indirect measurement of oxygen consumption
or carbon dioxide production). The choice depends on the purpose of the test and the properties of the test item. Respirometric tests are suitable for volatile or insoluble compounds, samples with a lot of particles or when there is risk of foaming.

The tests are performed batch-wise in test vessels where defined suspensions of activated sludge (microorganisms) are introduced together with the test item. Beside the test item treatments a series of controls are performed: control (background), reference item (microbial activity test) and toxicity control. Tests are carried out in controlled environment rooms with constant temperature in the dark with a standard test duration of 28 days. Rate and extent of biodegradation can be quantified.

Biodegradation Tests performed at AnoxServices accredited laboratory:

OECD 302 B: Inherent Biodegradability Test – Die-away measurements of DOC (as standard) or COD (upon request). This test is also called Zahn-Wellens test or EMPA-Test

OECD 301 A: Ready Biodegradability Test – Die-away measurements of DOC (as standard) or COD (upon request).

OECD 301 F: Ready Biodegradability Test – Respirometric analysis

Good Laboratory Practice GLP Reg. № 8233

SWEDAC ACKREDITERING 2031 ISO/IEC 17025

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