

Nørresundby 21st September 2020

To:
Thorkil Olesen,
Energy and Environmental Manager, FF Skagen.

Measurement of COD and BOD in waste water from fish industries

As promised, I have tried to find information about measurement of COD and BOD in waste water from fish industries. Unfortunately, it has not been possible for me to find an official memo describing that analysis of waste water from fishing industries can result in the BOD analysis giving higher results than the COD analysis.

I have just spoken with former director of Nordlab in Skagen, Torben Kristensen, who has many years of experience in these analyzes.

Torben has several years ago performed a number of experiments with measurement of BOD and COD in samples containing Trimethylamine.

The result for measuring BOD gives the expected oxygen consumption. The result for measuring COD gives no oxygen consumption and thus a result of zero.

Wastewater from fish industries typically also contains volatile substances, such as volatile acids.

For COD measurement, the sample is heated to 148°C with sulfuric acid and potassium dichromate to oxidize all organic material.

If the sample contains volatile compounds, there is a risk that some of these may disappear before the oxidation is complete.

BOD is made at 20°C in glass bottles with a tight-fitting glass stopper.

A more accurate way to measure organic matter content can be TOC (Total Organic Carbon)

Our equipment burns at 1200°C the entire sample in a closed system and identifies the CO₂ evolved using an IR detector, which is very specific for CO₂. The content is then converted to C (TOC).

Content of any inorganic carbon (carbonates) are of course removed before this analysis is carried out.

To investigate this matter in practice, we suggest to perform a series of measurements of BOD, COD and TOC on synthetic samples, which contain both trimethylamine and dimethylamine to elucidate the problem using concrete measurements.

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