The ideal measuring range for every application

Introduction

COD is still the sum parameter that provides the most reliable and timely information about the oxygen depleting effects of **organic pollutants** in wastewater. Measuring COD by means of the Hach® TNTplus™ Vial Test is **simple, reliable, affordable** and **environmentally responsible**. Five practice related measuring ranges ensure top quality results and preliminary dilution of the sample is usually no longer necessary.

Definition and relevance of COD

According to USEPA method 5220 D, COD is the amount of oxygen equivalent to the mass of potassium dichromate that reacts with the oxidisable substances in water under the working conditions of the method. Mercury sulfate, silver sulfate and sulfuric acid are specified as auxiliary reagents. The reaction time is 2 hours at 150 °C. The sample must be homogenised before the analysis is performed.

Chemical oxygen demand (COD), as a sum parameter for organic pollution, is an indispensable element of wastewater analysis. It is the most frequently mentioned monitoring parameter in legislation and serves as a design basis for the construction and efficiency of sewage treatment plants.

Its rapid availability and the narrow scatter of the measurement results make it stand out against BOD. The often discussed TOC provides clear information about the proportion of carbon in the organic pollution, but not about the amount of oxygen needed for biodegradation.

COD analysis with Cuvette Tests

Principle

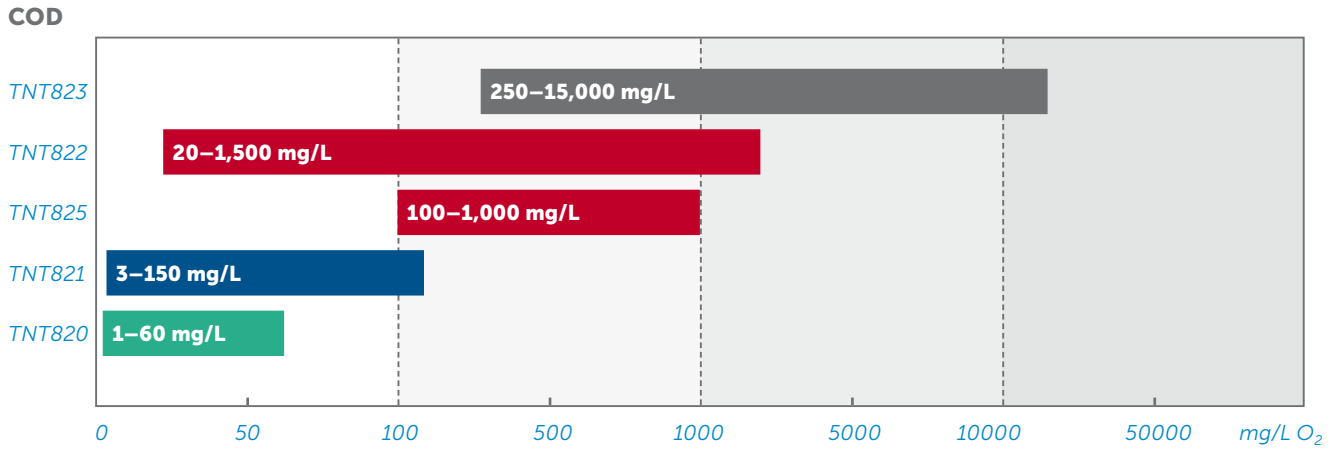
The Hach TNTplus Vial Tests are based on the same reaction principle as the standard. Only the quantities of sample and reagents, and the evaluation method (photometric instead of volumetric) are different. The Cuvette Test uses over 90 % less reagents than the standard method of determination.

Less work, more occupational safety

The determination of COD with a cuvette test could not be easier. The measurement cuvette already contains all the necessary chemicals in exactly measured amounts, and the user simply adds a defined amount of the homogenised sample.

For minimum effort and maximum quality of results, five practice-related measurement ranges are available. This allows for direct COD determination from the homogenised original sample in nearly all cases. Thus eliminating the need for time-consuming, potentially incorrect dilution.

The closed cuvette is then heated for two hours at 150 °C in a dry thermostat. The cuvette is then evaluated with a precalibrated Hach photometer. Since the reagents are predosed in exact known quantities in the cuvette and the heating is carried out in a closed system, there is a high level of safety, as contact with the chemicals is virtually eliminated.



The Hach TNTplus COD range with 5 practice-related measuring ranges from 5 to 15,000 mg/L O_2.
GHS Hazard Codes for COD Cuvette Tests: GHS05, GHS06, GHS08, GHS09 (see page 4)

Quality of the results
The results of the Hach TNTplus Vial Tests are comparable with those of the standard method. This has been confirmed over a number of years in comparative studies carried out by standard laboratories and by the results of official round robin tests.

A prerequisite for recognition of measurement results, irrespective of whether operational or standard methods are used is always the implementation and documentation of QA/QC measures, i.e. standard analyses, regular participation in round robin tests, etc..

Costs
Cost comparisons of operational analysis and standard analysis show that COD determinations with vial tests are clearly advantageous.

Treatment and recycling
Ecologically the TNTplus Vial Test is far superior to the standard method. On the one hand, much smaller amounts of environmentally harmful chemicals are used, and on the other hand, Hach provides support regarding disposal services for used cuvettes in the US and Canada.

Conclusions
COD is still one of the most important parameters in wastewater analysis. For assessing wastewater and water, and the control of sewage treatment plants the determination of COD with the TNTplus Vial Test System offers numerous advantages:

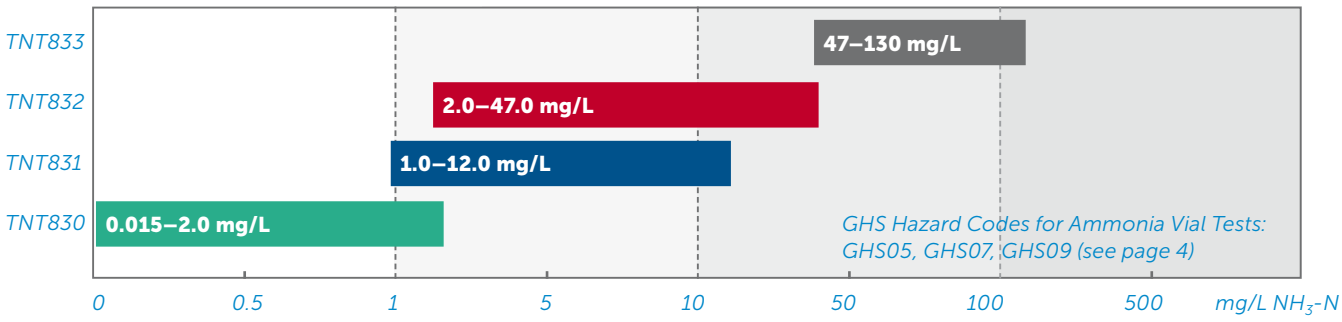
- Standard-compliant method 40 CFR 136.6
- Reliable and comparable measurement results
- 5 practice related measuring ranges, incl. one that is free of mercury
- Less work
- Increased occupational safety
- Affordable
- Disposal/recycling service for reprocessing of the used reagents

Comparison of the amount of chemicals used by the standard method and the vial test.

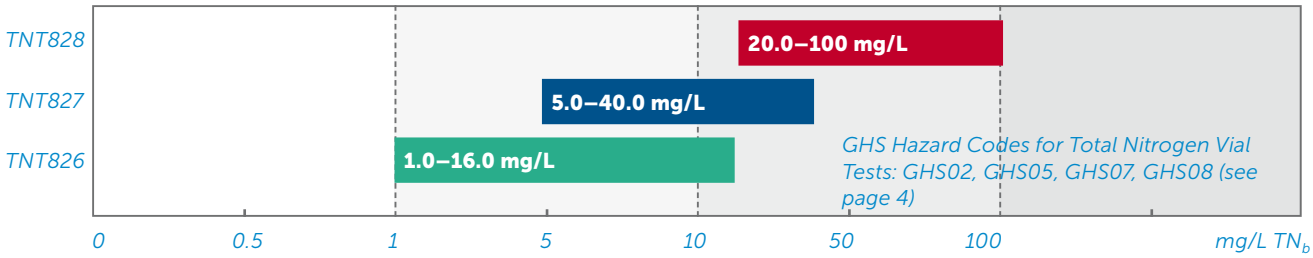
Nutrient parameters

In addition to COD, nutrients are important control parameters for wastewater stream monitoring and effluent compliance. TNTplus Vial Tests are also available for these parameters across multiple measuring ranges to cover the complete treatment process.

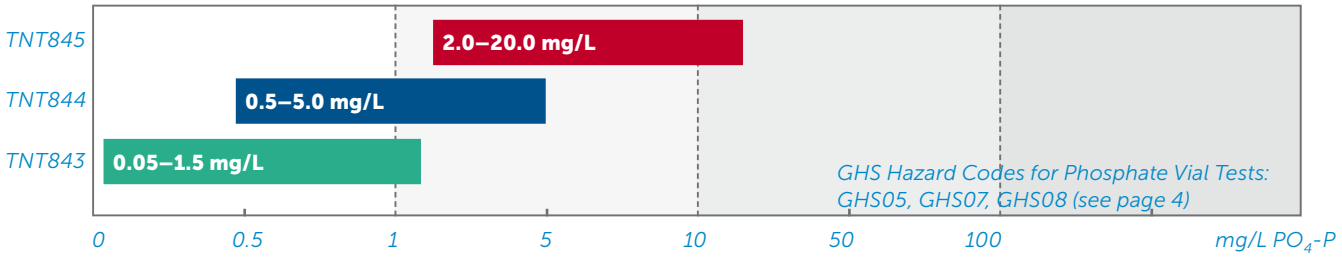
Ammonia



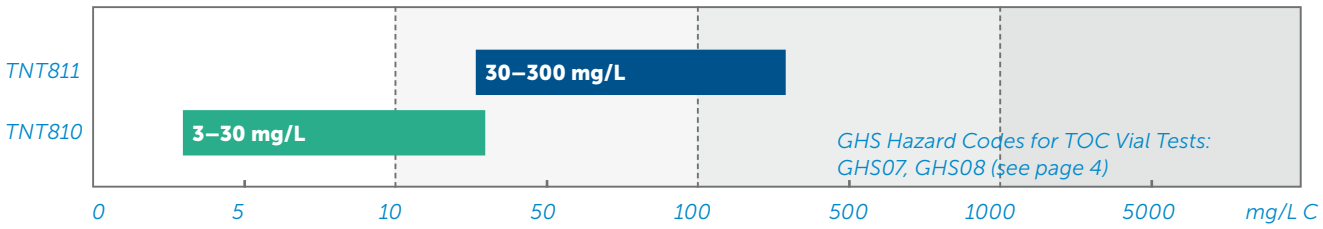
Total Nitrogen



Phosphate



TOC



GHS Hazard Codes

GHS02 GHS03 GHS05 GHS06 GHS07 GHS08 GHS09

For an overview of all TNTplus Vial Tests please visit:
www.hach.com/tntplus

DOC042.53.20023.Feb16

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