LIQUID ANALYTICAL RESOURCE

QuickCODlab

COD-ANALYSIS

Clean COD measurement in the laboratory.
Chemical-free.

Clean. Fast. Precise.

ENVIRONMENT-FRIENDLY COD ANALYSIS

You can now determine Chemical Oxygen Demand quickly, cleanly and safely – without toxic chemicals, catalysts or reagents.

Chemical oxygen demand (COD) is one of the most important sum parameters in water analysis. It is considered as a reference for the organic load of waste water, both in the industrial and municipal sectors. Conventional COD analysis is based on the use of toxic reagents. However, the safe and environmentally-friendly alternative is thermal oxidation.

COD - Relevance and versatility.

Chemical oxygen demand (COD) describes the amount of oxygen needed to chemically oxidize organic compounds in water. The aim is to determine the demand for oxygen, which is a fundamental requirement to oxidize organic matter. Oxygen demand is relevant to the planning, operation and efficiency of wastewater treatment plants, and is a basis for calculating sewage charges.

COD measurement methods.

The standard potassium dichromate method (DIN 38409 H41 H44) dominates the market. It is also available in a modified form as cuvette tests (DIN ISO 15705:2003). Here, potassium dichromate is used as an oxidizing agent, silver sulphate as a catalyst, as well as sulphuric acid. Mercuric chloride is also used to mask chloride interferences. This risky chemical cocktail is heated after the aqueous sample has been added, and then simmered for approximately two hours. The oxygen demand is calculated from the concentration of residual dichromate.

The high consumption of hazardous substances has long been the subject of lively debate.

Economic efficiency versus results.

The cost-effectiveness of both wet chemical COD procedures needs to be assessed, due to the difficulty of automating them and because of the staff costs involved. With a larger sample throughput, the personnel costs for non-automated procedures become disproportionately large.

The cuvette tests are cheaper, due to the low procurement costs, if the annual throughput remains less than around 250 samples. Automated procedures (such as the LAR QuickCODultra or QuickTOCultra) are preferable with increasing numbers of samples.

Until now, no reagent-free and rapid method has been used to determine the oxygen demand in the laboratory.

LAR's solution: The QuickCODlab.

At 1,200°C
Complete and Accurate Water Analysis

The COD procedure from LAR Process Analysers AG is based on the thermal oxidation of the sample at 1200°C, with subsequent detection of the oxygen consumption. This method (ASTM D6238-98) has been employed hundreds of times in the field of online monitoring and has been specially developed for use in the laboratory.

The crucial point with QuickCODlab: The high-temperature procedure developed by LAR enables the reliable oxidization of all the organic compounds in the sample at a temperature of 1,200°C.

The procedure does not need any catalysts or other hazardous or corrosive reagents. Furthermore, the measurement results are free of chloride interference due to the unique process management.

Fig.1

The sample is injected into the reactor using the precision syringe supplied. This is easy to use and allows different sample volumes to be dosed exactly.

The homogenized sample is injected directly into the reactor (Fig.1), where it is completely oxidized and accurately analyzed with an O2 detector.

Fast. Clean. Precise.
Determining the COD within minutes.

The QuickCODlab ensures a high operational reliability and is easy to use. The measured values are output directly to a standard computer and can be quickly and easily processed. The COD measurement is available in just a few minutes.

AT A GLANCE

- The COD value indicates the amount of oxygen consumed during the oxidation of organic substances of a water sample.
- Standard COD procedures are subject to criticism due to their high consumption of hazardous chemicals.
- A reliable measurement system needs to be environmentally-friendly and free of chloride interference.
- A temperature of 1,200°C guarantees complete combustion and eliminates the need for chemicals.
- The QuickCODlab precisely determines the COD within minutes.

THE COD-ANALYZER.

A hot furnace. The high temperature makes the difference.

Warm, warmer, hot. Tracking organic loads at 1,200°C.

The catalyst-free ceramic furnace forms the heart of the QuickCODlab. At 1200°C all sample constituents decompose, permitting a complete analysis of oxygen demand, without chloride interference and without chemicals or catalysts.

COD analysis. Fast and reliable.

The sample is injected directly into the reactor with a precision syringe, minimizing any possible handling errors. The measurements are then fed directly to the computer for immediate processing.

The real oxygen demand. Even with changing sample matrices.

In this filtration-free method the sample is injected directly into the furnace, for accurate and reliable results, even with varying sample matrices.

Ultra-fast measurement.

The QuickCODlab measures COD in less than 3 minutes, so 3 measurements are possible within just 10 minutes. The QuickCODlab offers enormous time savings compared to standard procedures.

O2 detection. Simple and reliable.

An O2 detector determines the oxygen used to digest the sample, and oxygen demand can be measured over a variety of user-defined ranges from 5 to 100 mg/l.

High salt concentrations no problem.

The QuickCODlab easily handles salt concentrations of up to 10 g/l, and up to 300 g/l of sodium chloride with the high-salt option. The salts passing through the furnace are carried with the condensate and collected as solids, so no salt residue forms in the furnace and there is no need for sample dilution, even at high salt concentrations, which improves accuracy.

Thermal oxidation - the clean solution.

The reagent-free QuickCODlab provides occupational safety and environmental protection, achieving a very high level of reliability and ease of use without environmentally harmful chemicals.

THE PRINCIPLE.

Even if the water is dirty – the measurements are clean!

The QuickCODlab works analogous to American Standard Method (ASTM D6238-98). Instead of the standardized 900°C, LAR uses 1200°C, enabling catalyst-free COD measurement.

Injection by precision syringe.

No more pipetting inaccuracies. The precision syringe holds exact volumes of 1-200 µg, for optimal volume selection.

Measurement. Fast and reliable.

The carrier gas supply ensures an accurately determined O2 concentration for complete oxidation (Fig. 2) and is adjustable to user-configurable ranges. A valve prevents gas exchange, so the O2 detector measures only the oxygen consumed.

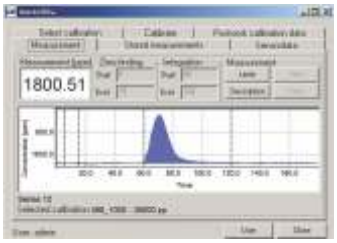

Fig. 3

View of a measuring curve.

The software. Easy to use.

The easy-to-use software is organized by tabs. It includes an extensive library of measuring ranges, as well as calibration and parameter settings for quick and accurate sample analysis. Measurements are automatically evaluated, graphed as tables and curves, then stored, and can be exported for further processing (Fig. 3).

With the QuickCODlab, the analytical compartment is separated from the electronics.

All areas can be accessed with just a few hand movements.

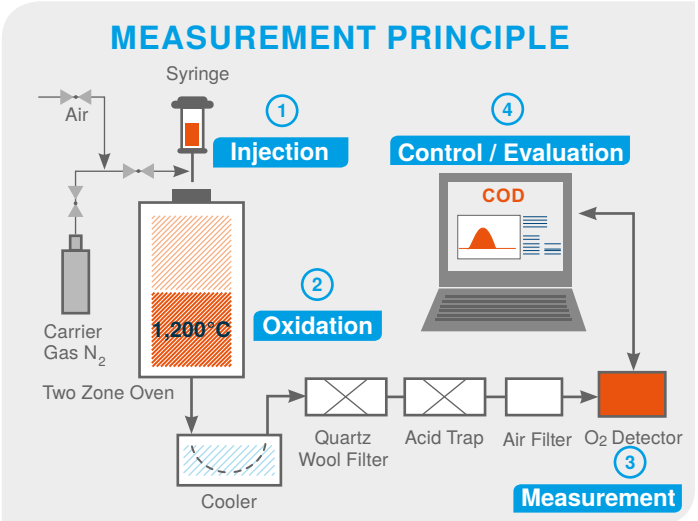

Fig. 2

1) Manual injection of the sample
2) Combustion and oxygen consumption
3) Measurement of the O2 required
4) Control and evaluation using Windows-based software

QuickCOD$_{lab}$ AN OVERVIEW

Laboratory COD measurement for all water samples – even the tough stuff.

The QuickCODlab analyzes water samples for COD content. Neither chemicals nor catalysts are required thanks to the process management involved. The samples are oxidized completely at 1200°C – the actual COD is determined in just three minutes.

Fast and precise – you can rely on the QuickCOD lab.

FEATURES & BENEFITS

- ✓ Accurate determination of the real COD
- ✓ Measurements in just three minutes
- ✓ Extensive measuring ranges
- ✓ Proven 1200°C thermal oxidation principle
- ✓ No catalyst needed
- ✓ Reliable measurement without re-agents
- ✓ Easy to operate
- ✓ Predefined injection volume
- ✓ Excellent chloride acceptance
- ✓ Very low measurement costs
- ✓ High operational reliability
- ✓ Very low operation & maintenance costs

TECHNICAL DATA

Measurement Technique	
Measuring technique	Combustion, ASTM D6238 - 98
Measuring ranges	1 - 100 mg/l, 10 - 200 mg/l, 100 - 1,000 mg/l, 1,000 - 3,000 mg/l, 2,000 - 10,000 mg/l, Other user-configurable ranges
Response time	Three minutes
Sample injection	Manual sample injection using a precision syringe
Dimensions and weight	
Housing	Steel, IP 54, powder-coated
Dimensions	19.3 x 16.5 x 17.3 in. (W x H x D)
Weight	81.5 lb.
Electrical connection data	
Power supply	115 / 230 VAC, 50/60 Hz
Safety	Internal 2/6 A, external 16 A
Device handling and data output	
Software	LAR QuickCODlab
Operating Systems	Microsoft Windows 7 or higher
Data interface	USB 2.0, LAN (optional)
Data output:	Export as csv -file
Installation requirements	
Gas Supply	Nitrogen (N2) as carrier gas (via pressure bottle), Clean, oil-free air

LIQUID ANALYTICAL RESOURCE

Liquid Analytical Resource, LLC
1701 Creek Road, Suite D
West Bend, WI 53090

Phone: 262-429-1310
Fax: 262-429-1313
email: marketing@larllc.com