

Wastewater analysis in treatment plants



- Chemical oxygen demand (COD) by titration
- Anions and cations by ion chromatography



Metrohm ...

- is the global market leader in titration
- offers a complete portfolio for NIR and Raman analysis, in addition to all of the methods of ion analyses – titration, voltammetry, and ion chromatography
- is a Swiss company and manufactures exclusively in Switzerland
- grants a 3-year instrument warranty and a 10-year warranty on chemical suppressors for anion chromatography
- provides you with unparalleled application expertise
- offers you more than 1800 applications free of charge
- supports you with expert service through local representatives and regional support centers
- is not listed on the stock exchange, but is owned by a foundation
- gives the interest of customers and employees priority over maximizing profit

Professional support for wastewater analysis in treatment plants

Operators of wastewater treatment plants are obliged to monitor their installation to control its performance. Part of this duty – depending on the size of the treatment plant – is regular determination of various parameters in the laboratory.

Metrohm is able to support you with top-quality analytical instruments, extensive application know-how and first-class onsite service. If you have any analytical questions, our product specialists would be happy to assist you at any time.

Selected standards from the field of treatment plant analysis

The following selected standards describe numerous international test and requirement specifications.

Metrohm analyzers meet all the minimum requirements and limits set in the respective standards.

Parameter	Standard	Method
Chemical oxygen demand (COD)	ISO 6060 ISO 15705 ASTM D1252 DIN 38409-44	Titration
Fluoride	EPA 340.2	Titration
Chloride	DIN 38405-1	Titration
Alkalinity CaCO ₃	EPA 310.1	Titration
Total hardness, Ca ²⁺ , Mg ²⁺	DIN 38406-3	Titration
Anions, e.g., F ⁻ , Cl ⁻ , Br ⁻ , NO ₂ ⁻ , NO ₃ ⁻ , PO ₄ ³⁻ , SO ₄ ²⁻ etc.	ISO 10304-1 EPA 300.0/EPA 9056	Ion chromatography
Cations, e.g., Li ⁺ , Na ⁺ , K ⁺ , NH ₄ ⁺ , Mg ²⁺ , Ca ²⁺ etc.	ISO 14911:1998	Ion chromatography
Oxyhalides	EPA 300.1, Part B	Ion chromatography
Chromium(VI)	ISO 10304-3 EPA 218.7	Ion chromatography
Zn, Cd, Pb, Cu, Tl, Ni, Co	DIN 38406-16	Voltammetry
EDTA, NTA	DIN 38413-5	Voltammetry
Total organic carbon content (TOC)	ISO 8245 DIN EN 1484 EPA 415.1	Process Analysis

Chemical oxygen demand according to DIN 38409-44

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Definition

The chemical oxygen demand (COD) is a measured value for the substances in a certain volume of water that can be oxidized by chromate.

Significance in treatment plants

In treatment plants the COD value is a valuable indicator for evaluating treatment performance. Here, with the COD balance, it is possible, amongst other things, to assess the oxygen demand in the aeration tank and to describe the sludge stabilization conditions.

Automation solutions

Manual determination of the COD value involves a great deal of work and, because the individual manual steps are difficult to reproduce, usually means inaccurate results. Metrohm resolves these problems with a fully automated system.



The MATI 12 system for fully automated COD determination

Metrohm COD systems

Metrohm offers different automation systems for COD determination according to the scale of testing. With these systems, the solutions needed for digestion (potassium dichromate and silver sulfate-sulfuric acid) can be added fully automatically – if need be, with cooling. The unpleasant handling of these aggressive and harmful solutions is reduced to a minimum, saving time and money.

Following digestion, the samples are titrated fully automatically with the same system directly in the reaction vessels. At the end of each titration, the titrated sample is drawn off with the help of a peristaltic pump and the

vessels are rinsed intensively several times with demineralized water. These precleaned vessels can then be used without any problems, as they no longer contain concentrated acids.

The indication of the titration with a maintenance-free gold Titrode, together with the monitoring possibilities incorporated within the system, makes fully automatic COD titration easy, precise, and reliable. All the methods needed for COD determination have been worked out and are ready for use. With the **tiamo** software supplied with the equipment it is possible to manage all the methods and determinations with the greatest of ease.

Benefit from COD analyzers from the market leader



You save time

- Automatic addition of all the necessary reagents
- Up to 40 samples can be analyzed fully automatically



You save money

- Every day due to low ongoing costs by comparison with other methods
- The investment soon pays for itself



Fully automatic determination of the COD value at Agrolab Bruckberg with two 855 COD Robotic Titrosamplers



Simultaneous determination of anions and cations with 930 Compact IC Flex instruments in combination with a 858 Professional Sample Processor, optionally extendable, e.g., with Inline Dilution, Inline Ultrafiltration or Inline Dialysis.

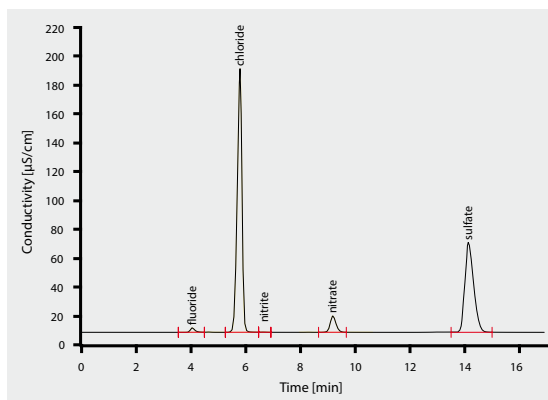
Anions and cations by means of ion chromatography

Metrohm professional ion chromatography

Modern ion chromatography (IC) allows efficient separation of inorganic and low-molecular organic anions and cations. The ions can be determined in parallel over a wide concentration range.

The spurious particles, colloids, algae, or bacteria present in many wastewater samples are removed fully automatically by, for example, Inline Ultrafiltration or Inline Dialysis before analysis. The 930 Compact IC Flex, in combination with the 858 Professional Sample Processor, allows for this. Additionally, samples can be automatically diluted.

The intelligent chromatography software MagIC Net then takes charge of instrument control, data management, and system monitoring. If need be, the system can also be configured as «one-button IC» for personnel from other areas of work.



Determination of anions in wastewater; column: Metrosep A Supp 5 - 150/4.0; eluent: 3.2 mmol/L Na₂CO₃, 1.0 mmol/L NaHCO₃, 0.7 mL/min; column temperature: 25 °C; sample volume: 20 µL; conductivity detection with sequential suppression

Your advantages with Metrohm ion chromatography



You save time

- Simultaneous determination of anions and cations
- Flexible sample changer
- Inline Dilution, Inline Ultrafiltration or Inline Dialysis



You save money

- Low ongoing costs, e.g., for an anion/cation system with sample changer approx. € 1800 p.a. for 1000 wastewater samples
- 10-year warranty of chemical suppressors for anion chromatography
- 3-year warranty on all instruments



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