



SULFUR AND CHLORINE MICRO COULOMETRIC TITRATOR

Sulfur and Chlorine Micro Coulometric Titrator - TT-4929

The Sulfur and Chlorine Micro Coulometric Titrator TT-4929 measures trace concentrations of total sulfur and total chlorine in petroleum products. It also covers crude oil and related hydrocarbon samples. The instrument combusts each sample in a quartz tube. Combustion gases then route into a titration cell for coulometric measurement. Refinery labs, petrochemical plants, and upstream production facilities rely on the TT-4929 to catch contaminants early, before they cause equipment damage or a failed product specification.

Sulfur and chlorine are common contaminants in crude oil and hydrocarbon feedstocks. Chlorine can hydrolyze into hydrochloric acid during refining. This acid corrodes piping and distillation equipment over time. Sulfur compounds pose a separate risk, since they can poison the catalysts used in downstream chemical processes. The TT-4929 quantifies both elements at trace levels. This gives quality control teams the data needed to catch contamination before it reaches production equipment.

The instrument conforms to four ASTM standards: D4929, D3120, D3246, and D5808. Together these methods cover chlorine in crude oil, sulfur in light liquid hydrocarbons, sulfur in petroleum gas, and organic chloride in aromatic hydrocarbons. This combined standards coverage lets a single TT-4929 unit support sulfur and chlorine testing across a refinery or petrochemical lab's full sample slate. Labs avoid the cost of separate instruments for each matrix.

APPLICATIONS

Sulfur and Chlorine Micro Coulometric Titrator - TT-4929 Applications

The TT-4929 supports sulfur and chlorine contamination control anywhere trace levels of these elements threaten equipment or product quality.

- **Petroleum Refining Corrosion Control:** measures organic chloride in crude oil per ASTM D4929 to catch chloride before it hydrolyzes into corrosive hydrochloric acid downstream
- **Petrochemical Catalyst Protection:** verifies that aromatic hydrocarbon feedstocks stay within organic chloride limits per ASTM D5808, protecting the catalysts used in chemical manufacturing
- **Upstream Crude Oil Quality Control:** screens crude oil for organic chlorides and sulfur at the production stage, where high contaminant levels can devalue the crude or damage pipeline infrastructure
- **Gasoline and Diesel Sulfur Specification Testing:** measures trace sulfur in light liquid petroleum hydrocarbons per ASTM D3120 to confirm finished fuels meet regulatory sulfur limits
- **Petroleum Gas Sulfur Monitoring:** quantifies total sulfur in petroleum gas streams per ASTM D3246 for hydrocarbon gas quality control
- **Marine and Lubricating Oil Testing:** supports sulfur and chlorine screening across marine fuel and lubricating oil quality programs
- **Aromatic Hydrocarbon and Chemical Feedstock Purity Testing:** confirms aromatic hydrocarbons and related chemicals meet organic chloride purity requirements before use in downstream synthesis

Standards

The TT-4929 conforms to the internationally recognized test methods for microcoulometric sulfur and chlorine determination in petroleum products.

- ASTM D4929 - Standard Test Methods for Determination of Organic Chloride Content in Crude Oil
- ASTM D3120 - Standard Test Method for Trace Quantities of Sulfur in Light Liquid Petroleum Hydrocarbons by Oxidative Microcoulometry
- ASTM D3246 - Standard Test Method for Sulfur in Petroleum Gas by Oxidative Microcoulometry
- ASTM D5808 - Standard Test Method for Determining Organic Chloride in Aromatic Hydrocarbons and Related Chemicals by Microcoulometry

FEATURES

Sulfur and Chlorine Micro Coulometric Titrator - TT-4929 Key Features

The TT-4929 pairs a combustion-based sample introduction system with a coulometric detector built for trace-level repeatability.

- **Windows-Based Control and Data Archiving:** a Windows platform manages analysis and data processing while displaying full system status, storing or printing results as needed and archiving up to 5,000 sample records for historical retrieval and graphical playback
- **Low-Noise Detection Circuitry:** internationally sourced circuits and components keep electrical noise down, supporting sensitive detection of trace sulfur and chlorine concentrations
- **Fast Per-Sample Analysis:** completes each analysis in 3 to 4 minutes, supporting higher throughput than older coulometric designs
- **Reduced Water Quality Sensitivity:** design upgrades ease the strict water quality demands that limit traditional coulometric titrators, delivering CRM conversion rates between 90% and 110% with reverse calibration deviation held to 5% or less
- **Long-Life Cracking Furnace:** high-quality heating wire construction extends the service life of the combustion furnace
- **Automatic Over-Temperature Protection:** the software cuts power to the furnace wire and combustion tube if temperature exceeds the programmed limit, protecting both components
- **Programmable Delayed Cooling:** operators set a post-analysis cooling period, after which the instrument shuts down automatically once cooling completes
- **Reverse-Suction Gas Alarm:** a gas cut-off alarm flags reverse suction events before they can contaminate the cracking tube
- **High-Performance Spiral Combustion Tube:** a coking-resistant spiral design supports injection speeds up to 1 µl/s, improving results on volatile, trace-level halogen samples

- **Low-Maintenance Chlorine Titration Cell:** an all-silver rod electrode needs no prior preparation, and the cell's 35 ml charge of 75% glacial acetic acid supports at least 4 hours of service and 60 tests before maintenance is required
- **Open LIMS Database Management:** an open Laboratory Information Management System architecture supports straightforward database retrieval and integration with lab data systems

TECHNICAL SPECIFICATIONS

Sulfur and Chlorine Micro Coulometric Titrator - TT-4929 Technical Specifications

Parameter	Specification
Applicable Standards	ASTM D4929, D3120, D3246, D5808
Measuring Range (Sulfur)	0.1 to 10,000 mg/kg
Measuring Range (Chlorine)	0.3 to 10,000 mg/kg
Sample Type	Solid, liquid, or gas (injector selected per sample type)
Temperature Control Range	Ambient to 1000°C ± 1°C
Repeatability (X < 1.0 mg/kg)	Cv ≤ 20%
Repeatability (1.0 to 10 mg/kg)	Cv ≤ 10%
Repeatability (X > 1.0 mg/kg)	Cv ≤ 5%
Combustion Tube Injection Speed	Up to 1 µl/s
Chlorine Titration Cell Capacity	35 ml, 75% glacial acetic acid
Chlorine Titration Cell Service Life	60 tests / at least 4 hours before maintenance

Parameter	Specification
Data Storage	Up to 5,000 sample records



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