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# INDUCTIVELY COUPLED PLASMA EMISSION SPECTROSCOPY (ICP-OES) - TORONICP™ 700TP (PETROCHEMICAL EDITION)

Inductively Coupled Plasma Emission Spectroscopy (Petrochemical Edition) is a specialized inductively coupled plasma spectrophotometer engineered for high-accuracy elemental analysis in demanding petrochemical environments. Using advanced inductively coupled plasma emission spectroscopy, the system generates a stable, high-temperature inductively coupled plasma that enables reliable, simultaneous multi-element detection in fuels, lubricants, additives, and organic chemical products.

This petrochemical-focused platform incorporates optimized sample introduction, oxygen assisted combustion, and low-temperature fog chamber technology to effectively process complex organic matrices with minimal preparation. Intelligent automation and robust plasma control allow consistent, laboratory-grade results even for users without prior experience in inductively coupled plasma analysis, making the system well suited for routine quality control and advanced petrochemical testing laboratories.

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ToronICP™-700TP
Inductively Coupled Plasma Emission
Spectroscopy (Petrochemical Edition)

# APPLICATIONS

## Applications

The Inductively Coupled Plasma Emission Spectroscopy (Petrochemical Edition) ToronICP™ 700TP is purpose-built for petrochemical and energy-related elemental analysis, including:

- Fuel analysis of gasoline and diesel with direct injection, eliminating complex digestion steps
- Lubricating oil and additive testing, measuring over 20 wear metals and additive elements
- Used oil analysis for condition monitoring and contamination assessment
- Petrochemical raw material testing, including methanol and ethanol
- Automotive fluid analysis, such as urea solutions and specialty oils
- Oilfield and tracer analysis, including rare earth element determination

GASOLINE
DIESEL

## FEATURES

# Inductively Coupled Plasma Emission Spectroscopy (ICP-OES) - ToronICP™ 700TP (Petrochemical Edition) Key Features

- Inductively Coupled Plasma Emission Spectroscopy (ICP-OES) for fast, simultaneous multi-element analysis
- STCC-BOX Refrigerated Fog Chamber, providing rapid cooling to −25 °C for stable volatile sample introduction
- Direct organic sample injection, reducing preparation time and improving workflow efficiency
- Oxygen-assisted injection technology, minimizing carbon deposition and improving plasma stability

- High-sensitivity atomization system, optimized for petrochemical matrices
- Precision temperature control, enhancing analyte stability and repeatability
- User-friendly automated operation, suitable for both expert laboratories and first-time ICP users

## THEORY & METHOD

# Theory and Working Principle

Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES) is a powerful method for elemental analysis. This technique utilizes an extremely hot, stable plasma, generated by energizing argon gas with a radio-frequency electromagnetic field, which can reach temperatures exceeding 10,000 K.

The process involves converting liquid samples into a fine aerosol and introducing them into this high-temperature plasma. Within the plasma, the elements in the sample become excited and subsequently emit light at specific wavelengths unique to each element. An inductively coupled plasma spectrophotometer then detects this emitted light, allowing for the simultaneous identification and precise quantification of multiple elements.

ICP-OES is highly valued for its speed, accuracy, high sensitivity, minimal chemical interference, and broad linear measurement range. These characteristics make it a reliable and versatile tool across various fields, including environmental monitoring, metals analysis, industrial quality control, and scientific research.

## TECHNICAL SPECIFICATIONS

# Inductively Coupled Plasma Emission Spectroscopy (Petrochemical Edition) ToronICP™- 700TP Technical Specifications

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|---|---|
| **Model** | ToronICP™-700TP |
| **Analytical Technique** | Inductively Coupled Plasma Emission Spectroscopy (ICP-OES) |
| **Application Focus** | Petrochemical, fuels, lubricants, additives, organic chemicals |
| **Sample Introduction** | Direct injection with high-efficiency atomizer |
| **Fog Chamber** | STCC-BOX refrigerated fog chamber |
| **Fog Chamber Temperature** | Down to −25 °C |
| **Cooling Time** | Stable temperature achieved in ~10 minutes |
| **Plasma Support** | Oxygen-assisted injection system |
| **Elements Analyzed** | Metals and trace elements in organic and oil-based samples |
| **Operation Mode** | Fully automated |
| **Sample Preparation** | Minimal or no digestion required |
| **Intended Use** | Laboratory and industrial petrochemical analysis |
| **Analytical speed** | 10 elements every minute |
| **Wavelength range** | 195-800nm |
| **Accuracy** | Relative standard deviation RSD≤2% |
| **Single package size** | 1680 x 740 x 1320 mm |
| **Weight** | 100 KG |

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