



ELEMENTAL COMPOSITION ANALYZERS

Elemental Composition Analyzers

Elemental composition analysis determines the fundamental building blocks of petroleum products and solid fuels — the concentrations of carbon, hydrogen, nitrogen, and sulfur within the sample matrix. These elemental parameters define a fuel's energy content, combustion behavior, emission potential, and chemical character, making elemental composition analyzers indispensable tools in fuel characterization, environmental compliance, and petroleum research laboratories.

Torontech offers two dedicated elemental composition analyzers: a Carbon, Hydrogen, and Nitrogen (CHN) elements analyzer for simultaneous multi-element measurement, and a Carbon and Sulfur analyzer for combined C/S determination. Together, these instruments cover the primary elemental analysis requirements of petroleum products, solid fuels, cokes, coals, and related materials.

APPLICATIONS

Application

Elemental composition analyzers serve critical measurement needs across petroleum, energy, and environmental applications:

- Petroleum coke (petcoke): Carbon, hydrogen, and sulfur elemental composition determination for fuel grade and calcined petcoke quality control and pricing.
- Coal and solid fuels: Proximate and ultimate elemental analysis (C, H, N, S) for coal classification, calorific value estimation, and combustion emission prediction.
- Lubricant base oils and additives: Carbon-to-hydrogen ratio and nitrogen content determination for base oil characterization and additive analysis.
- Crude oil and residual fractions: Elemental composition of heavy fractions provides inputs for coker and residue upgrading process modeling.

- Refinery catalysts: Carbon and sulfur analysis of spent catalysts to determine coke deposition and sulfur poisoning levels.
- Environmental samples: CHN and carbon/sulfur analysis of soil, sediment, and wastewater samples for environmental monitoring and remediation programs.
- Biodiesel and biofuels: Elemental composition verification for certification and quality compliance of renewable fuel feedstocks and finished biofuels.

FEATURES

Why Choose Torontech's Series for Your Elemental Composition Analysis?

Torontech's elemental composition analyzers are engineered for the accurate, efficient determination of key elemental parameters in demanding petroleum and fuel sample matrices:

- Simultaneous Multi-Element Analysis: The CHN elements analyzer simultaneously determines carbon, hydrogen, and nitrogen content from a single combustion measurement, improving analytical efficiency compared to sequential single-element methods.
- Combined C/S Analysis: The carbon and sulfur analyzer provides rapid combined carbon and sulfur determination in a single instrument, eliminating the need for separate carbon and sulfur analytical platforms for fuel and materials testing.
- High-Temperature Combustion Principle: Both elemental composition analyzers use high-temperature combustion to ensure complete oxidation of all carbon, hydrogen, nitrogen, and sulfur species in complex petroleum and solid fuel matrices, delivering accurate total elemental values.
- Wide Sample Matrix Compatibility: Suitable for liquid petroleum products, solid cokes, coals, catalysts, and organic materials — providing broad elemental composition analyzer application flexibility.
- Regulatory and Standard Compliance: Torontech's elemental analyzers support compliance with ASTM D5373 (CHN in coal and coke), ASTM D4239 (sulfur in coal), ISO 29541, and related standards for elemental composition determination.



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