CS744 / 844 with S832 Add-On

Combining a LECO 744 or 844 Series carbon and sulfur analyzer with an 832 Series add-on carbon and sulfur analyzer will give your laboratory the capability to determine the amount of carbon and sulfur present in all but the most challenging of matrices. This system supports the analysis of both inorganic and organic matrices, either independently or simultaneously, without the need to switch from one flow path to another. This system combines the power and performance of both systems, increases the flexibility of the lab, all while reducing bench space requirements.

System Highlights

- Choice of induction or resistance furnace
- Supports the analysis of both inorganic and organic matrices for carbon and sulfur within a single platform
- Independent detectors and operating software instances support simultaneous operation of both furnace types, doubling the efficiency and eliminating the risk of cross contamination with shared flow paths relative to competitive offerings
- No performance deficiencies compared to the stand-alone induction and resistance furnace models
- Single computer and monitor for reduced cost and bench space; Shared optional analytical balance
- Optional independent automation for both the induction furnace with 10- and 60-sample options, and the resistance furnace with a 100-sample option

832 Autoloader

SL10 Shuttle Loader

SL60 Shuttle Loader

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Theory of Operation

LECO CS-series carbon and/or sulfur determinators, when combined with the add-on SC-series carbon and/or sulfur determinator, become an extremely flexible platform for the determination of carbon and sulfur in almost any solid matrix. This platform can determine the sulfur and carbon content in not only a wide variety of organic materials such as coal, coke, fuel oils, and soils but is also applicable to inorganic materials such as, cement, limestone, ores, and metals. Both systems utilize high temperature combustion with non-dispersive infrared detection (NDIR).

For the induction system, a pre-weighed sample of approximately 1 g is combusted in a stream of purified oxygen using RF induction to heat the sample. Carbon and sulfur present in the sample are oxidized to carbon dioxide (CO_2) and sulfur dioxide (SO_2), and swept by the oxygen carrier through a heated dust filter, a drying reagent, and then through non- dispersive infrared detection (NDIR), where sulfur is detected as SO_2. The gas flow continues past a heated catalyst, where carbon monoxide (CO) is converted to CO_2 and where SO_2 is converted to sulfur trioxide (SO_3), which is subsequently removed by a filter. Carbon is then detected as CO_2 with non-dispersive infrared detection (NDIR). A pressure controller is used to maintain constant pressure in the NDIR cells to reduce interference from natural variations in atmospheric pressure. The final component in the flow stream is an electronic flow sensor, which is used for diagnostic purposes and to monitor the carrier flow.

For the resistance system, analysis begins as a sample is weighed into a combustion boat and placed into the furnace typically regulated at 1,350 °C with a pure oxygen environment. The sample combusts, releasing carbon as CO_2 gas with the sulfur forms being oxidized and released as SO_2 gas. After a preset time, additional oxygen is introduced via a ceramic lance directly above the sample to accelerate the combustion of refractory materials. The combustion gases are swept to the back of the furnace and then forward through the inner and outer furnace tubes, allowing the combustion gases to remain in the high temperature zone of the furnace ensuring efficient oxidation. Upon exiting the furnace, the combustion gases flow through anhydrone tubes removing moisture and on to the flow controller, setting the flow of the combustion gases through the NDIR sulfur and/or carbon detection cells.

Non-dispersive infrared cells are based on the principle that CO_2 and SO_2 absorb infrared (IR) energy at unique wavelengths within the IR spectrum. Incident IR energy at these wavelengths is absorbed as the gases pass through IR absorption cells with the absorption being dependent upon the path length of the cell. The concentration of unknown samples is determined relative to calibration standards. An external PC with LECO CORNERSTONE® brand software manages all the quantitative calculations and saves all of the data.

Each system can be operated independently or simultaneously, by switching between two instances of *Cornerstone* software on the single PC. This platform is most efficient when combined with an optional 10- or 60-position induction furnace auto loader and the optional 100-position resistance furnace auto loader, providing hours of simultaneous unattended multi-matrix operation.

Specifications

For full instrument specifications, refer to the 832 Series, 744 Series, or 844 Series specification sheets. For full optional autoloader specifications, refer to the 844-744 Series Shuttle10, 844-744 Series Shuttle60, or the 832 Series Autoloader specification sheets.

Part Number

SC832-A	Sulfur/Carbon 832 instrument for add-on to an existing 744/844 Series *Cornerstone* Instrument system
S832-A	Sulfur 832 instrument for add-on to an existing 744/844 Series *Cornerstone* Instrument system

LECO Corporation
3000 Lakeview Avenue | St. Joseph, MI 49085
Phone: 1-269-985-5496
info@leco.com | www.leco.com

LECO Europe
eu.leco.com

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