



CARBON / SULFUR ANALYZER

CS-580A

**ELTRA's CS-580A is the ideal elemental analyzer for simultaneous determination of carbon and sulfur in organic samples. It features a resistance furnace with vertical ceramic tube and uses ceramic crucibles as sample carriers.**

An automatic sample loader allows for analysis of large numbers of samples without operator intervention. The sample loader is available in two versions to accommodate 36 or 130 crucibles. For reliable analysis of acidified samples (TOC analysis), both versions are available in an acid-resistance configuration.

The temperature can be set in steps of 1 °C to a maximum of 1,550 °C. Thanks to sample weights of up to 500 mg and more even inhomogeneous materials can be reliably analyzed. The CS-580 A elemental analyzer can be equipped with up to four independent infrared cells for measuring carbon and sulfur concentrations, allowing for a great variety of applications.

## **BENEFITS CS-580A**

- | Fast, simultaneous elemental analysis of C and S, TOC and TIC
- | Configurable for one-element (C or S) or multi-element (C & S) analysis
- | Wide concentration range from 0.005 – 100 %
- | High weights possible for elemental analysis of heterogeneous samples
- | Optional autoloader with 36 or 130 positions (acid-resistant version available)



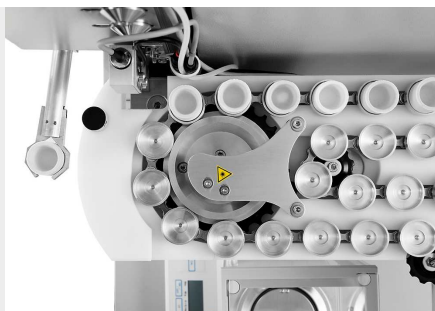
### **CARBON / SULFUR ANALYZER CS-580A**

## **OPERATION AND ANALYSIS PROCESS**

Operation of the CS-580 A elemental analyzer is simple, fast and convenient. The samples are weighed and registered in the software as manual analysis or analysis via autoloader. Typical sample weights are between 50 and 500 mg. After starting the analysis, the sample is introduced into the furnace and the combustion gases CO<sub>2</sub> and SO<sub>2</sub> are measured in up to four infrared measuring cells. The results of the elemental analysis can be exported via LIMS, report or text file.



*Logging the sample into the software and weighing*



*Placing sample in autoloader and analysis*



*Measurement results and export*

## CARBON / SULFUR ANALYZER CS-580A

### CONFIGURATIONS AND OPTIONS

The elemental analyzer CS-580 A can be configured to meet a wide range of customer requirements. C, S and C/S configurations are available with up to 2 infrared cells for each element to cover a wide working range. Robust measuring cells for the reliable determination of sulfur in very high concentrations are also available.

The ELTRA CS-580 A series is perfectly equipped for TOC analysis according to DIN EN 15936 with optional acid-resistant autosamplers, as well as the optional TIC module.

An optional autoloader with 130 crucible positions is available for elemental analyses with high sample throughput.



*Analyzer with optional TIC module*



*Autoloader with 130 crucible positions*



*Autoloader with acid-resistant plastic crucible holders*

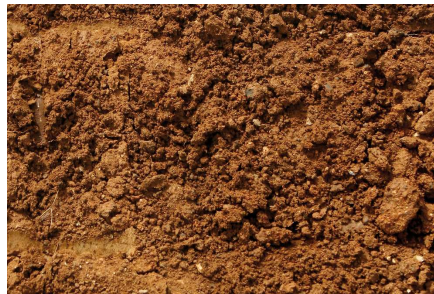
CARBON / SULFUR ANALYZER CS-580A

## TYPICAL SAMPLE MATERIALS

The CS-580 A elemental analyzer is perfectly suited for measuring carbon and sulfur concentrations in matrices such as ashes, building materials, coal, coke, gypsum, limestone, oil, plant materials, rubber, sand, soil, soot, tobacco, waste, ...



*coal*



*soil*



*tobacco*

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## FUNCTIONAL PRINCIPLE

In the CS-580A elemental analyzers the sample is burnt in an oxygen atmosphere at temperatures of up to 1,550 °C. The furnace temperature can be freely selected in steps of 1 °C. The combustion gasses (CO<sub>2</sub>, H<sub>2</sub>O, SO<sub>2</sub>) coming from the furnace pass through a dust filter. After the water vapor is chemically absorbed, the dried CO<sub>2</sub> and SO<sub>2</sub> gas is detected in the additional infrared cells. Depending on the configuration, it is possible to combine up to four infrared cells with different sensitivities to measure carbon and sulfur concentrations.

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## TECHNICAL DATA

|                               |                                                                                                                                             |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Measured elements</b>      | carbon, sulfur                                                                                                                              |
| <b>Samples</b>                | organic                                                                                                                                     |
| <b>Furnace alignment</b>      | vertical                                                                                                                                    |
| <b>Sample carrier</b>         | ceramic crucibles                                                                                                                           |
| <b>Field of application</b>   | agriculture, biology, chemistry / plastics, coal / power plant, construction materials, environment / recycling, medicine / pharmaceuticals |
| <b>Furnace</b>                | resistance furnace (ceramic tube), adjustable up to 1550 °C (steps of 1 °C)                                                                 |
| <b>Detection method</b>       | solid state infrared absorption                                                                                                             |
| <b>Number of IR cells</b>     | 1 - 4                                                                                                                                       |
| <b>Material of IR path</b>    | gold                                                                                                                                        |
| <b>Typical analysis time</b>  | 60 - 120 s                                                                                                                                  |
| <b>Chemicals required</b>     | magnesium perchlorate, sodium hydroxide                                                                                                     |
| <b>Gas required</b>           | oxygen 99.5 % pure (2 - 4 bar / 30 - 60 psi)<br>compressed air (4 - 6 bar / 60 - 90 psi)                                                    |
| <b>Power requirements</b>     | 230 V, 50/60 Hz, max. heat up current 2000 W                                                                                                |
| <b>Dimensions (W x H x D)</b> | 55 x 100 x 60 cm (analyzer)<br>85 x 35 x 45 cm (Autoloader for 130 crucibles)                                                               |
| <b>Weight</b>                 | ~ 90 kg (analyzer)<br>~ 15 kg (Autoloader for 130 crucibles)                                                                                |
| <b>Required equipment</b>     | PC, monitor, balance (resolution 0.0001g)                                                                                                   |
| <b>Required accessories</b>   | Autoloader (for 36 or 130 crucibles)                                                                                                        |
| <b>Optional accessories</b>   | TIC module, voltage stabilizer 5 KVA                                                                                                        |

[www.eltra.com/cs580A](http://www.eltra.com/cs580A)

## ORDER DATA

### ELTRA CS-580A

(Please order PC, monitor, balance, Autoloader and consumables (starter-kit, anhydron, sodium hydroxide) separately)

#### Measuring ranges at 500 mg sample weight

2)

|            |                                                                                     |         |              |                                                           |
|------------|-------------------------------------------------------------------------------------|---------|--------------|-----------------------------------------------------------|
| 88100-4015 |    | CS-580A | 1xC          | 0.05 – 100% C                                             |
| 88100-4017 |    | CS-580A | 2xC          | 0.005 – 12% C   12 – 100% C                               |
| 88100-4018 |    | CS-580A | 2xS          | 0.005 – 2% S   2 – 20% S                                  |
| 88100-4019 |    | CS-580A | 1xC<br>+ 1xS | 0.05 – 100% C<br>0.005 – 2% S                             |
| 88100-4020 |   | CS-580A | 1xC<br>+ 2xS | 0.05 – 100% C<br>0.005 – 2% S   2 – 20% S                 |
| 88100-4021 |  | CS-580A | 2xC<br>+ 1xS | 0.005 – 12% C   12 – 100% C<br>0.005 – 2% S               |
| 88100-4022 |  | CS-580A | 2xC<br>+ 2xS | 0.005 – 12% C   12 – 100 % C<br>0.005 – 2 % S   2 – 20% S |

**Further measuring range combinations on request**

### REQUIRED ACCESSORIES

#### PC, MONITOR, BALANCE

|            |                                                                                                                |
|------------|----------------------------------------------------------------------------------------------------------------|
| 71015-1000 | Computer with Intel Core i5-8400 Processor, 256 GB SSD; 8 GB RAM; Windows 10 operating system; keyboard; mouse |
| 88400-0584 | Monitor, TFT (23.8")                                                                                           |
| 88400-0645 | Balance (resolution 0.0001 g)                                                                                  |
| 14535      | Autoloader for 36 crucibles                                                                                    |
| 14535-1001 | Autoloader for 36 crucibles, acid resistant                                                                    |
| 14533      | Autoloader for 130 crucibles                                                                                   |
| 14533-1001 | Autoloader for 130 crucibles, acid resistant                                                                   |

## REQUIRED CONSUMABLES / CHEMICALS FOR FIRST OPERATIONS

88500-0005 Starter-kit for 500 analyses CS 580A (500 crucibles, 50 g glass wool, 100 g Combsolid)

90200  Anhydron (magnesium perchlorate), 454 g l)

90210  Sodium hydroxide, 500 g l)

## FURTHER OPTIONS AND CONSUMABLES

### ACCESSORIES (HARDWARE)

88200-3800  TIC-Module

72070 Oxygen regulator

88400-0610 Barcode scanner

88600-0015  Crucible holder

### CHEMICALS (FILLINGS FOR GLASS AND QUARTZ TUBES)

90200  Anhydron (magnesium perchlorate), 454 g l)

90210  Sodium hydroxide, 500 g l)

90331  Glass wool, 454 g

90332  Glass wool, 50 g

92610  Tube of high vacuum grease, 35 g

88600-0008  Combsolid, 100 g

91000-1005  Copper, flakes, 25 g

|            |                                                                                   |                    |
|------------|-----------------------------------------------------------------------------------|--------------------|
| 90840      |  | Quartz sand, 100 g |
| 88400-0508 |  | Steel wool         |

#### CRUCIBLES

|            |                                                                                   |                                                                 |
|------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 90149      |  | Ceramic crucibles, premium, Ø 1",<br>foil-wrapped, 1,000 pieces |
| 90148      |  | Ceramic crucibles, premium, Ø 1",<br>bagged, 1,000 pieces       |
| 88400-0176 |                                                                                   | Ceramic filtering crucibles, 100 pieces                         |
| 88400-0142 |                                                                                   | Filtering crucibles, 100 pieces, small version                  |

#### REAGENT TUBES

|       |                                                                                     |                                        |
|-------|-------------------------------------------------------------------------------------|----------------------------------------|
| 09090 |  | Reagent tubes 32 x 280 mm, 1 piece     |
| 09092 |  | Reagent tube XL size, 54 x 36 x 280 mm |
| 09093 |  | Reagent tube XXL size, length 280 mm   |

#### TOOLS FOR OPERATION: SPATULAS, TWEEZERS, TONGS AND OTHER

|            |                                                                                     |                                                              |
|------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 88400-0229 |  | Tweezers (160 mm), curved, 1 piece                           |
| 88400-0472 |  | Tweezers (145 mm), straight, 1 piece                         |
| 88400-0475 |  | Set with 6 spatula and 1 tweezers                            |
| 88400-0477 |  | Weighing boat, 1 piece, for weighing and usage of granulates |
| 90145      |  | Tongs for ceramic crucibles and boats, 220 mm, 1 piece       |

90146



Steel pot for preheated crucibles and used crucibles

#### TOOLS FOR MAINTENANCE

35400-8000 Maintenance kit CS-580A

71010



Brush, 16 mm, 1 piece, for cleaning balance from dust

88400-0473



Powder funnel (plastics), 1 piece, for easy filling of chemical tubes

88400-0490



Rubber plug 29 x 35 x 30 mm, 1 piece, for sealing big glass tubes like 09090

88600-0026 Anhydron filter tube

## CALIBRATION MATERIALS

**Calibration materials may show slight variations depending on the current lot.**

**To see the current certification please visit [www.ELTRA.com](http://www.ELTRA.com).**

#### COAL: CERTIFIED SULFUR CONTENT

92511-3005 Coal, 50 g, < 0.1 % S

92511-3010



Coal, 50 g, 0.1 – 0.5 % S

92511-3020



Coal, 50 g, 0.5 – 1.0 % S

92511-3030



Coal, 50 g, 1.0 – 1.5 % S

92511-3040



Coal, 50 g, 1.5 – 2.0 % S

92511-3050



Coal, 50 g, 2.0 – 3.0 % S

92511-3060



Coal, 50 g, 3.0 – 4.0 % S

92511-3070



Coal, 50 g, 4.0 – 5.0 % S

92511-3080



Coal, 50 g, >5.0 % S

**COAL, PREMIUM, C/H/N/S, ASH, VOLATILE CONTENT, CERTIFIED**

92550-3010

Coal, premium, 50 g, < 1.0 % S

92550-3020



Coal, premium, 50 g, ~ 1 % S

92550-3040



Coal, premium, 50 g, 1.0 – 3.0 % S

92550-3060



Coal, premium, 50 g, > 3.0 % S

**COKE, PREMIUM, C/H/N/S, ASH, VOLATILE CONTENT, CERTIFIED**

92560-3010



Coke, premium, 50 g

**PET COKE, PREMIUM, C/H/N/S, ASH, VOLATILE CONTENT CERTIFIED**

92570-3020

Pet coke, premium, 50 g, ~ 1 % S

92570-3040

Pet coke, premium, 50 g, ~ 1 % S

**OTHER**

90812-3001



Limestone, 25 g, 0.04 % S

90812-3002



Limestone, 25 g, 0.4 % S

90812-3003

Limestone, 25 g, < 5 % C

90812-3004

Limestone, 25 g, 5 – 10 % C

90817-3001

Soil, 25 g, > 2 % C, S

90817-3002

Soil, 25 g, < 1 % C, S

90817-3003

Soil, 25 g, > 2 % C, S

90817-3004

Soil, 25 g, > 2 % C, S

91900-1001



Ore, 30 g, ~1.4 % S

91900-1002



Ore, 30 g, ~4.2 % S

91900-1003

Ore, 30 g, ~3 % S

#### PRIMARY SUBSTANCES FOR CALIBRATION

90710-3010



EDTA, 50 g

90710-3030

Sucrose, 50 g

90810



Calcium carbonate, 100 g

90821



Barium sulphate, 50 g

90824



Sulfanilic acid, 50 g

91900-2001

Zinc sulfide, 50 g, 32 % S

#### LIQUID CALIBRATION MATERIAL

**Please note: Every analyzer requires PC, monitor, balance and some consumables (crucibles, chemicals) which have to be ordered separately**