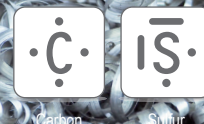


C,S determination in pure iron



Suitable analyzers

- ELEMENTRAC CS-i

Used accessories

- Ceramic crucibles (90149)
- Tungsten accelerator (90220)
- Suitable calibration material (NIST or other)



Application Settings

I) General

Sample type:	Advanced
Standby flow:	180 l/h
Lance Purging:	on
Purging while closing:	yes
Open Furnace:	yes
Furnace purge through:	Exhaust
Furnace purge time:	3 sec
Furnace purge flow:	180 l/h

Stabilizing

Lance valve:	on
Stabilize by time:	off
Stability:	0.001
Minimum time:	30 sec
Maximum time:	60 sec

II) Analysis

Voltage:	100 %
Power duration:	30 sec
Flow:	180 l/h
Chamber only:	0 sec
Lance and chamber:	0 sec
Drift compensation:	on

Channel	Max time [sec]	Min time [sec]	Integration delay [sec]	Comparator factor [%]
Low C	90	40	6	0.1
Low S	90	30	6	0.1

III) Postwaiting

Postwaiting time:	10 sec
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C,S determination in pure iron

Sample preparation

Make sure that your sample is free from contaminations and inclusions which could influence the carbon determination. Pre-heat the crucibles at least for 1 h at 1000 °C. Let the crucibles cool down in a desiccator. Eltra recommends to use a carrier gas purification furnace to optimize the precision of the carbon determination in the lower ppm range. The application note show typical results either with and without using a carrier gas purification furnace.

Procedure

- Prepare ELTRA analyzer (e.g. exchange anhydron, sodium hydroxide, platin catalyst if necessary); clean the combustion tube, brush, heat shield, dust trap
- Run three warm up samples (e.g. steel samples (92400-3050) with a minimum weight of 500 mg; add 1.7 g tungsten)
- Calibrate the analyzer with suitable calibration material (NIST or other)

The procedure of analysis pure iron should be like this:

- (1) Weigh in approx. 500 mg into the crucible
- (2) Add 1.7 g of tungsten accelerator (90220)
- (3) Place the crucible on the pedestal and start analysis

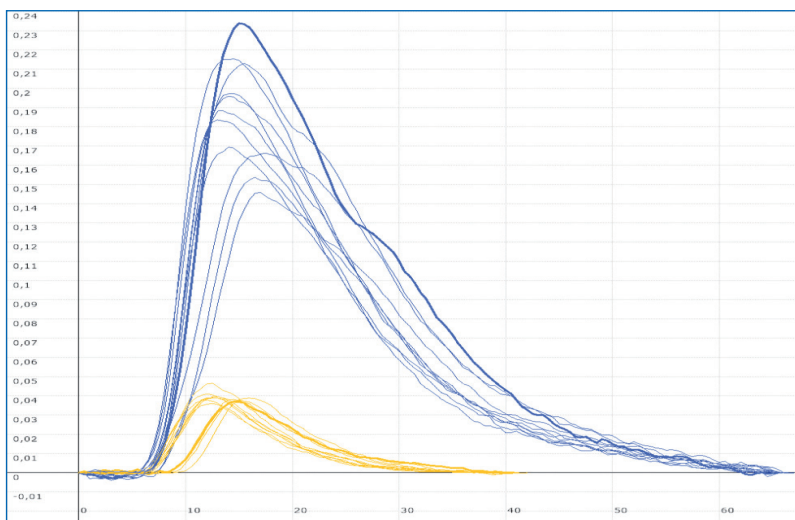
Repeat steps (1) – (3) at least three times;

Mark the results and use the calibration function in the software.

-> Now start with the actual analysis.

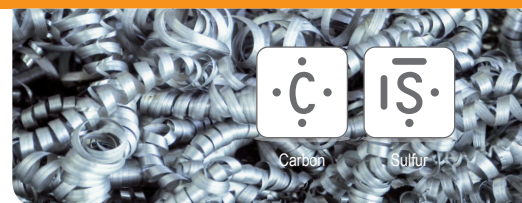
Typical results		
ELTRA 88600-0013 (LOT 716C) ¹⁾		
Weight (mg)	Carbon (ppm)	Sulfur (ppm)
512.4	6.05	10.65
603.9	5.08	10.88
528.5	6.07	11.23
506.7	5.41	11.18
499.2	7.84	11.78
502.2	5.43	10.76
506.9	6.19	10.21
504.6	7.54	11.33
506.8	6.47	10.76
516.6	6.63	11.32
504.7	4.85	11.22
Average values		
	6.14	11.03
Deviation / Relative deviation (%)		
	0.95/15.49	0.43/3.87

¹⁾ certified value: C: 6 ppm ±4 ppm
S: 11 ppm ±4 ppm



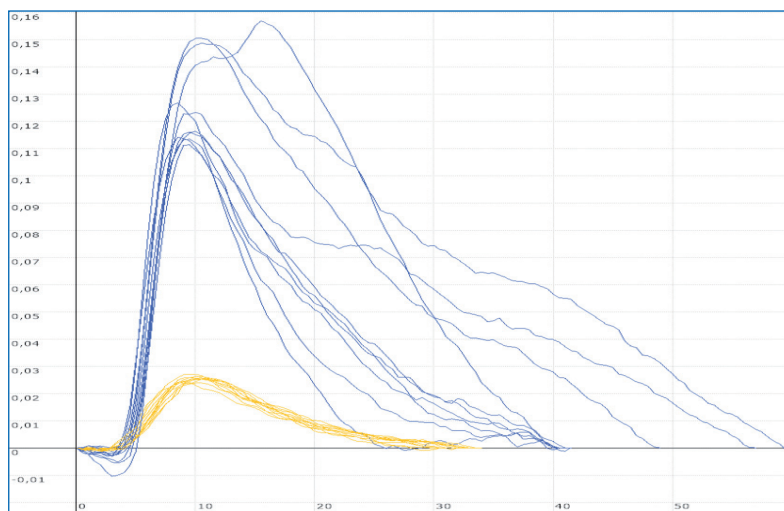
(1) Measurements without carrier gas purification furnace

C,S determination in pure iron



Typical results		
ELTRA 88600-0013 (LOT 716C) ²⁾		
Weight (mg)	Carbon (ppm)	Sulfur (ppm)
504.6	5.48	11.27
499.6	5.86	11.18
504.7	6.39	11.84
497.9	5.86	11.42
498.6	5.87	10.49
503.9	6.95	11.92
503.3	6.46	11.17
498.3	5.84	10.68
507.2	6.41	11.75
498.6	5.64	11.29
Average values		
	6.08	11.30
Deviation / Relative deviation (%)		
	0.45/7.48	0.47/4.14

2) certified value: C: 6 ppm $\pm$ 4 ppm
 S: 11 ppm $\pm$ 4 ppm



(2) Measurements with carrier gas purification furnace