

C, S determination in copper



Suitable analyzers

- ELEMENTRAC CS-i

Used accessories

- Ceramic crucibles (90149)
- Copper accelerator (90240)
- Suitable calibration material (NIST or other)



Application Settings

I) General

Sample type:	Advanced
Standby flow:	180 l/h
Lance purging:	on
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:	on
Stabilize duration:	15 sec

II) Analysis

Voltage:	95 %
Power duration:	60 sec
Flow:	180l/h
Chamber only:	30 sec
Lance and chamber:	2 sec
Drift compensation:	on

Channel	Max time [sec]	Min time [sec]	Integration delay [sec]	Comparator factor [%]
Low C	60	40	8	0.1
Low S	60	40	10	0.1

III) Postwaiting

Postwaiting time:	10 sec
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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.

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 copper should be like this:

- (1) Weigh in approx. 1000 mg into the crucible
- (2) Add 1 g of copper accelerator (90240)
- (3) Place the crucible on the pedestal and start analysis

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

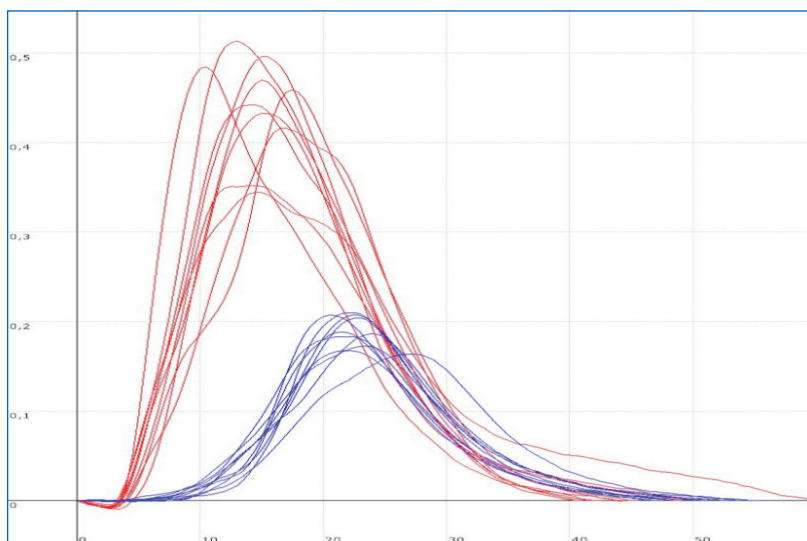
Mark the results and use the calibration function in the software.

-> Now start with the actual analysis.

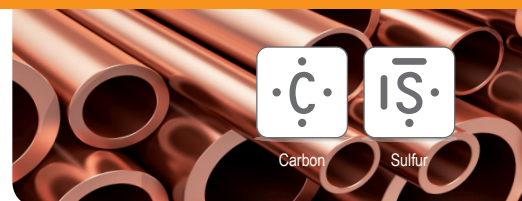


Typical results		
IARM 158 B ¹⁾		
Weight (mg)	Carbon (ppm)	Sulfur (ppm)
1071.1	18.71	30.35
1112.7	19.48	30.69
1124.3	15.64	28.77
1082.7	16.62	31.02
991.8	18.11	29.01
1133.2	13.74	28.93
1011.5	18.59	28.53
1086.7	20.06	29.37
1083.7	15.00	29.55
1071.8	16.19	28.32
Average values		
	17.21	29.45
Deviation / Relative deviation (%)		
	2.08/ 12.09	0.94/ 3.18

¹⁾ certified value: C: 0.0017% ±0.0005 (29.41%)
 S: 0.0028% ±0.0013 (46.42%)



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Typical results	
CRM 90/1 ¹⁾ Institute of Non-Ferrous metals; Gliwice, PL	
Weight (mg)	Sulfur (ppm)
1098.2	82.95
1046.3	84.83
1053.8	82.51
1025.7	84.38
1006.7	84.30
1002.8	84.44
1005.5	82.57
998.3	82.68
999.3	84.31
1005.4	84.11
	83.71
Deviation / Relative deviation (%)	
	0.91/1.09

1) certified value: S: 0.00837% ±0.00016 (1.91%)

