

Hydrogen determination in titanium samples



Suitable analyzers

- ELEMENTRAC ONH-*p*
- ELEMENTRAC OH-*p*

Used accessories

- Graphite crucibles (90180 and 90185)
- Tin pellets (90252)
- Suitable calibration material (NIST or other)



Application Settings

I) General

Furnace mode: OH

Furnace cooling: 35/45 °C

Standby Flow: 0

A flow of 10 l/h could improve precision when there is a long time distance between 2 measurements.

II) Outgasing and stabilizing

Setting / Phase	Time [sec]	Power [W]	Flow [l/h]
Outgasing	65	4000	27
Stabilizing	75	3800	27

A second outgasing cycle or an increased outgasing time could improve the precision for very low oxygen and nitrogen contents. To reduce dust it could be useful to split the outgasing cycle in 30 sec (0 W Power) and 30 sec (3800 W Power).

III) Analysis

Power duration: 35 sec

Drift compensation: on

Power: 3800 W

Open furnace: yes

Flow: 27 l/h

Channel	Minimum time [sec]	Maximum time [sec]	Integration delay [sec]	Comparator factor [%]
Low and High H	45	80	12	0.3

IV) Postwaiting

Postwaiting time: 25 sec

Furnace clean up: No

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Sample preparation

Make sure that the surface of the titanium is free from contaminations; otherwise clean the sample with acetone p.a. and let dry at atmosphere.

Procedure

- Prepare ELTRA analyzer (exchange anhydron, sodium hydroxide, Schuetze reagent if necessary), clean furnace, sample drop mechanism, electrode tip (if necessary)
- Run three blanks with empty crucibles
- Calibrate the analyzer with suitable calibration material (NIST or other)
 - (1) Fill one inner crucible (90180) with 2 tin pellets (90252) in one outer crucible (90185) and place them on the electrode tip, close furnace
 - (2) Weigh calibration material and place it in the sample drop mechanism and start analysis
 - (3) After analysis give the inner crucible into waste and fill in a new one. The outer crucibles can be used approximately 10 times

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	
91205-1001 Titanium Standard (LOT 114 C)	
Weight (mg)	ppm H
101.6	10.2
101	11.1
100.8	10.1
101.8	9.9
102	9.3
100.5	12
102.1	11.3
104.7	9.5
103.7	10.9
103.9	10.5
Average values	
	10.480
Deviation / Relative deviation (%)	
	0.847 / 8.08%