

Quantitative elemental analysis in nonferrous metals : Aluminum, copper, and titanium

Background and Challenges

Nonferrous metals such as aluminum, copper, and titanium are functional, lightweight materials with excellent thermal conductivity and heat resistance, and are used in a variety of applications. Oxygen, hydrogen, and sulfur are intentionally added to these materials to improve their functions. In addition, the concentration of oxygen, hydrogen and carbon as foreign substances is controlled to improve quality.

Lower oxygen content in pure copper leads to better electrical conductivity. Hence, it is important to control the oxygen content, which must be kept at ppm level. Titanium and aluminum require precise control of hydrogen concentration to prevent embrittlement. Carbon and sulfur must also be removed as much as possible during refining. For quality control, quantitative analysis of extremely small amounts of these trace elements is essential.

Solution from HORIBA

Carbon/Sulfur Analyzer
EMIA-Pro/Expert



Oxygen/Nitrogen/Hydrogen
Analyzer
EMGA-Pro/Expert



Testimonial from process control division

“For trace analysis, the higher the number of measurements, the greater the reliability of the results; the fast measurement speed in EMIA and EMGA ensure result reliability and reduce the overall time of a high-volume quality control processes.”



EMGA-Pro/Expert ONH				
Sample: Titanium				
Sample weight (g)	Oxygen (weight %)	Nitrogen (weight %)	Sample weight (g)	Hydrogen (weight %)
0.0504	0.07390	0.01640	0.1023	0.00023
0.0503	0.07180	0.01530	0.1125	0.00027
0.0506	0.07250	0.01710	0.1134	0.00021
Average	0.07273	0.01627	Average	0.00024

EMGA-Pro/Expert O		EMIA-Pro/Expert CS		
Sample: Copper		Sample: Copper		
Sample weight (g)	Oxygen (ppm)	Sample weight (g)	Carbon (weight %)	Sulfur (weight %)
1.0190	0.00047	0.7127	0.00842	0.00351
1.0230	0.00048	0.7248	0.00880	0.00364
1.0220	0.00051	0.6932	0.00820	0.00352
Average	0.00049	Average	0.00847	0.00356

※This data is an image only, as actual data cannot be released due to confidentiality obligations.

👍 Possible to detect ultra trace amount of CSONH, >0.6ppm

Additional solutions for ultra trace analysis

HORIBA has several additional optional units with functions that offer even more accurate trace analysis.



■ UV detector

Lower limit of sulfur detection improved from 1ppm to 0.2ppm with a dedicated detector



■ EMIA-Step

Gas collection function enables the analysis of trace amounts of gases with high accuracy



■ Transfer vessel

Reduces oxidation reactions of samples with outside air (EMGA-Pro/Expert)



■ Capsule press unit

Sealing device enables sealing without atmospheric entrapment. (EMGA-Pro/Expert)



[Product Website](#)



[Inquiry Form](#)

*Please contact us for details regarding special specifications.

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