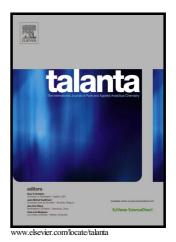
Author's Accepted Manuscript

Determination of ultra-trace sulfur in high-purity metals by isotope dilution inductively coupled plasma sector field mass spectrometry combined with chemical separation procedure

Ayaka Wada, Naoko Nonose, Masaki Ohata, Tsutomu Miura



 PII:
 S0039-9140(18)30699-4

 DOI:
 https://doi.org/10.1016/j.talanta.2018.07.007

 Reference:
 TAL18836

To appear in: Talanta

Received date: 13 April 2018 Revised date: 3 July 2018 Accepted date: 4 July 2018

Cite this article as: Ayaka Wada, Naoko Nonose, Masaki Ohata and Tsutomu Miura, Determination of ultra-trace sulfur in high-purity metals by isotope dilution inductively coupled plasma sector field mass spectrometry combined with chemical separation procedure, *Talanta*, https://doi.org/10.1016/j.talanta.2018.07.007

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

CCEPTED MAN

Determination of ultra-trace sulfur in high-purity metals by isotope dilution inductively coupled plasma sector field mass spectrometry combined with chemical separation procedure

Ayaka Wada, Naoko Nonose, Masaki Ohata, Tsutomu Miura*

Inorganic Standards Group, Research Institute for Material and Chemical Measurement (MCM), National Metrology Institute of Japan (NMIJ), National Institute of Advanced Industrial Science and Technology (AIST), 1-1-1, Umezono, Tsukuba, Ibaraki 305-8563, Japan nanuscri

^{*}To whom correspondence should be addressed: t.miura@aist.go.jp

Abstract

The analytical method of ultra-trace sulfur (S) in high-purity metal by isotope dilution inductively coupled plasma mass spectrometry (ID-ICP-MS) combined with chemical separation procedure was developed in the present study. In order to determine the ultra-trace S in high-purity metal, a chemical separation with alumina column was carried out before ICP-MS measurement. This method enabled to prevent the polyatomic ion interference arising from the metal matrix and the signal suppression derived from the space charge effect in ICP-MS. In order to achieve high sensitive analysis, an ICP-sector field mass spectrometer (ICP-SFMS) was used. The isolation of polyatomic ion interference with respect to S was also carried out in medium-resolution mode. In addition, measurement conditions including detector dead time, which affects the precision and accuracy of the isotope dilution method, and washout conditions that were employed to reduce memory effects were optimized. The developed method was validated by the determination of S in a high-purity iron reference material (JSS-001-4). The analytical result obtained by the developed method (1.86 mg kg⁻¹ \pm 0.12 mg kg⁻¹

Download English Version:

https://daneshyari.com/en/article/7675527

Download Persian Version:

https://daneshyari.com/article/7675527

Daneshyari.com