Kazuaki Wagatsuma et al., Insights in Analytical Electrochemistry, 3:2
DOI: 10.21767/2470-9867-C1-002

Application of internal standard method for determination of 3D-transition metallic elements in flame atomic absorption spectrometry using a multi-wavelength high-resolution spectrometer

Kazuaki Wagatsuma, Yusuke Toya, and **Toshiko Itagaki**
Tohoku University, Japan

Flame Atomic Absorption Spectrometry (FAAS) is a technique, which has been extensively applied for the quantitative determination of different elements in inorganic materials. A particular element can be quantified only once for measurement with the help of a conventional atomic absorption spectrometer; whereas, by using a spectrometer system comprising of a xenon-lamp, continuum light source and an echelle-type spectrograph, it is possible to conduct sequential multi-element and multi-wavelength analysis, thus enabling the FAAS measurement over a certain wavelength range simultaneously. Due to this superior performance, an internal standard method, which can correct the physical interference in the solution sample as well as a long-time drift of the measurement system, can be properly employed, which leads to an improvement in the analytical precision of FAAS. In this study, selection criteria of an internal standard element which could be applicable for the measurement of 3D transition metals, such as Fe, Ni, Ti, were investigated in details, indicating that platinum-group elements could be suitably selected for the internal standard method. In Ti-Pd, Ni-Rh, and Fe-Ru systems, chosen as typical combinations, several variances of the analytical results; for instance, a variation in aspirated amounts of sample solution and a short-period drift of the primary light source, could be corrected and thus reduced, when the absorbance ratio of the analytical line to the internal standard line was measured.

Biography

Kazuaki Wagatsuma is a professor of Tohoku University, Japan, who manages Laboratory for Analytical Science in Institute of Materials Research. His major is material analysis and analytical spectroscopy. He has published more than 300 scientific papers and review articles in the field of atomic spectrometry, X-ray spectrometry, and chemical analysis.

wagatuma@imr.tohoku.ac.jp

Notes: