Miho Tanaka et al., J Chromatogr Sep Tech 2017, 8:3(Suppl)
DOI: 10.4172/2157-7064-C1-025

Laser ablation inductively coupled plasma mass spectrometry for quantitative imaging of elements in ferromanganese nodule

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Laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) has been used for the quantitative elemental imaging of ferromanganese nodules to obtain the distributions of both major and trace elements, owing to its high sensitivity and wide dynamic range. In our study, data treatment system was developed for the quantitative imaging of elements in ferromanganese nodules. For obtaining a calibration line, a signal of Mg was monitored as an internal standard for correction. The validity of the values determined by LA-ICP-MS was confirmed by comparison with elemental contents obtained by ICP-MS. A two-dimensional plotting system for LA-ICP-MS was established for expressing elemental contents as colors along with spatial information. The simple method describes the ease with which the colors can be changed to define the content ranges of elements, and the elemental distributions show the layered structure, clearly depicting the contrast. Reproducibility of these analytical processes was also confirmed by analyzing two ferromanganese nodules. The method is expected to be a powerful tool for investigating paleo-environmental changes in the region surrounding a ferromanganese nodule and its formation processes.

Biography

Miho Tanaka completed her PhD at Tokyo University, Japan. She is specialized in Analytical Chemistry, Solution Chemistry and Mass spectrometry. Presently, she is actively involved in Chemical Speciation in Solution, as well as other topics. She has published more than 70 papers in peer reviewed journals.

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