**Determination of arsenic speciation in rice grain by IC-ICP-MS**

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***Introduction and Results***

The food safety has been becoming an important national and international focus in these days. Especially, arsenic(As) is considered one of the most important toxic elements in the environment because of its potential risk to human health and to ecosystems. So, we had developed the analysis method for arsenic speciation by using IC/ICP/MS and monitored the occurrence of arsenic species in rice grain.

Five species of As were mainly detected in rice such as As+3, As+5, AsB, DMA and MMA. Based on the As speciation in rice, As+3 (Arsenite) and As+5(Arsenate) were the major compounds and AsC was not detected. Arsenic speciation analysis of rice grains demonstrated that the inorganic forms were dominant in rice grain cultivated in Korea and USA. The concentration order of As species in rice grains was observed to As+3 > As+5. DMA > MMA. The percentages of inorganic As contents in rice samples from Korea and the USA were shown as similar results. The recoveries of fortified rice were 91~112 %. The LODs of As speciation method had been defined as 0.1~0.3 ug/kg

***Keywords***: Arsenic, Speciation, IC/ICP/MS, Rice

***Reference***

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(2) Nakamura Y, Narukawa T, Yoshinage J., *J. Agric Food Chem.* **2008**,56, 2536-2540.

Table 1. The occurrences of arsenic species in polished rice

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | AsB | DMA | As+3 | AsC | MMA | As+5 |
| Domestics | ND | 48.3~78.0 | 143.7~167.8 | ND | 9.2~10.1 | 24.6~27.0 |
| Imports | ND~7.5 | 67.0~72.9 | 137.8~212.8 | ND | 6.1~19.6 | 30.9~32.6 |
| LOD | 0.3 | 0.2 | 0.1 | 0.3 | 0.4 | 0.1 |
| LOQ | 1.0 | 1.0 | 0.3 | 1.0 | 1.0 | 0.3 |

Unit : ug/kg

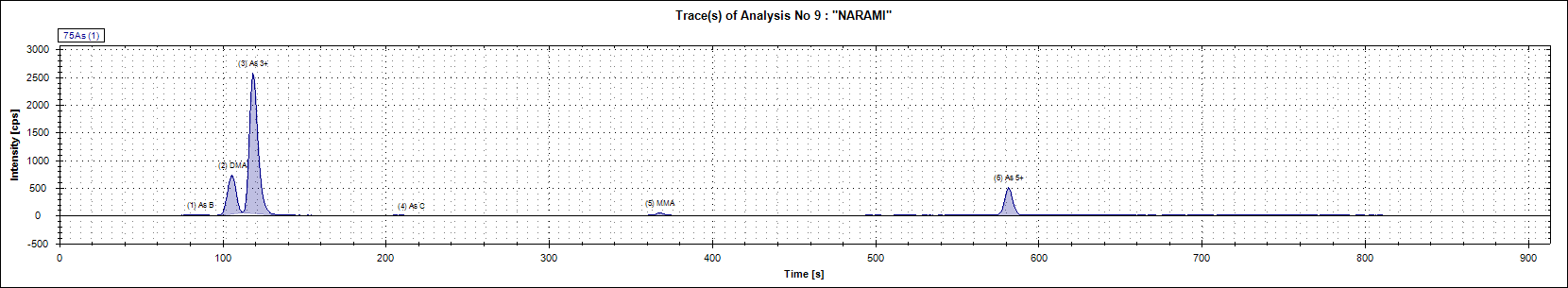


Figure 1. Chromatographic As species in rice grain sample using IC/ICP/MS

***Biography***

Dr. Cheong-Tae Kim completed his doctorate in food technology with “Reduction of acrylamide in fried foods by addition of amino acids and vacuum frying.” at Seoul National University in 2004. He has been worked at NONGSHIM CO. LTD since 1990. Dr. Kim has served a head of Food Safety Research Institute in his company from 2009 to present.

Dr. Kim has responsible for the food safety of raw materials and final products in his company. He has researched on the development and application of chemical analysis methods by using Mass spectrometer such as orbitrap-MS and IC/ICP/MS etc. And He has focused on studies of how to control microorganisms in products and plant facilities. Dr. Kim has been managing the all kinds of food safety compounds such as pesticides, antibiotics, GMO, allergens, food-born pathogen, irradiation foods and radioactive substances under the food safety policy of his company. His research and activity are focused on studies of chromatographic separation and identification and how to control the issues caused by biological materials.