Growing Demands for Metrology in Quality of Life

Plática Invitada

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ABSTRACT

National Metrology Institute of Japan (NMIJ) is responsible to disseminate coherent and comprehensive national measurement standards throughout Japan. NMIJ develops the certified reference materials (CRMs) under the following policy; 1) to declare the traceability to SI units according to ISO Guide 35, 2) to develop CRMs under the quality management system of ISO Guide 34, 3) to be accredited by a third body, 4) to be peer-reviewed internationally by the experts from other NMIs, 5) to participate to the international comparison coordinated by the Consultative Committee for Amount and Substance (CCQM).

NMIJ is disseminating about 100 kinds of calibration standards, such as pH standard solutions, element standard solutions, standard gases and organic solvent standard solutions, through Japan Calibration Service System (JCSS) under Japan Measurement Law. We have also developed more than 100 kinds of CRMs for method validation and/or quality control of measurements in various scientific and industrial fields. We are now disseminating the marine sediment CRMs for metallic elements, organo-metallic elements (As, Sn, Hg, etc), and PCB measurements, the fish tissue CRMs for food analyses and the clinical testing CRMs such as cholesterol, creatinine and steroids. We mainly apply the primary measurement procedures such as ID-MS, ID-ICPMS and the freezing point depression method, to characterization of the certified values of CRMs in order to declare the traceability to SI.

In recent years, strong demands for CRMs have been growing to secure the reliability of measurements rapidly and widely, because the importance of the traceability in measurements becomes recognized in scientific and industrial fields. For example, the regulation of residual pesticides in food stuff, which Japanese are extremely nervous about, was revised in 2006 and the positive-list system is adopted where about 800 kinds of pesticides are permitted to be used if their residual concentration levels are below the predetermined limits. As a result, the dissemination of proper series of reference materials of pesticides is strongly demanded to validate the measurement results under the regulation. However, it is almost impossible to develop such a large variety of reference materials in a short term. We are now establishing a new dissemination system of CRMs by applying quantitative NMR method. We will provide a proton-based traceability chain system, where a single national standard will be a unique traceability source for a various kinds of calibration kits used by the end users.