[This document is just explanation translated from the original Japanese certificate and some information is omitted from it.]

独立行政法人 産業技術総合研究所

計量標準総合センター 標準物質認証書

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan, Certificate

認証標準物質

NMIJ CRM 8112 - a

National Institute of Advanced Industrial Science and Technology
AIST

重金属分析用 ABS 樹脂ペレット(Cd, Cr, Hg, Pb; 低濃度)

Heavy metals (Cd, Cr, Hg, Pb) in ABS resin - low concentration pellet

This certified reference material (CRM) was produced on the basis of NMIJ's quality system under JIS Q 0034 (ISO GUIDE 34), and can be used to control the precision of analysis or to confirm the validity of analytical methods or instruments during the quantitative determination of Cd, Cr, Hg and Pb in ABS resin or similar polymers.

Certified Values

The certified values of Cd, Cr, Hg and Pb in this CRM are given in the following Table. The drying instruction is described in this certificate. Each expanded uncertainty was determined with the coverage factor $k = 2$; it defines an interval estimated to have a level of confidence of approximately 95%.

	Certified value, mass fraction (mg/kg)	Expanded uncertainty, (mg/kg)
Cd	9.383	0.223
Cr	94.47	1.11
Hg	94.10	2.87
Pb	94.98	0.87

Determination of Certified Values

Each certified value was determined by the following analytical methods:
(1) Microwave digestion using sulfuric acid and nitric acid / isotope dilution – inductively coupled plasma mass spectrometry (Cd, Cr, Hg and Pb),
(2) Dry-ashing digestion followed by open-system dissolution using nitric acid and hydrogen dioxide / inductively coupled plasma optical emission spectrometry (Cd, Cr and Pb),
(3) Microwave digestion using sulfuric acid and nitric acid / inductively coupled plasma mass spectrometry (Cd, Cr, Hg and Pb).

Traceability

Each certified value was determined by more than one methods including isotope dilution – mass spectrometry as a primary method of measurement with NMIJ primary standard solutions of Cd, Cr, Hg and Pb and is traceable to the International System of Units (SI).

Expiration of Certification

The certification of this CRM is valid until March 31, 2012, provided that the CRM is unopened and stored in accordance with the instructions given in this certificate.

Sample Form

This CRM consists of small pellets. The net mass is 25 g, kept in a brown glass bottle.

Homogeneity

The homogeneity of the CRM was determined by analysing 14 bottles selected at approximately same intervals in the order of bottling. The elements (Cd, Cr, Hg and Pb) were determined by microwave digestion using sulfuric acid and nitric acid / inductively coupled plasma mass spectrometry. The homogeneity of each element is reflected to the uncertainty of the certified value.

Notice for Storage

This CRM should be kept at room temperature (15 degree C - 35 degree C) and should not be shined directly upon.

Notice for Use

Prior to use, the sample should be mixed by slow rolling. It should be dried for one hour at 80 degree C and then stood at room temperature for one hour in silica-gel desiccator. The recommended minimum sample mass is 0.10 g or more for one analysis. Please note that this sample contains hundreds mg/kg of Br.

Preparation Method

Commercial ABS resin and powders of CdO, $PbCrO_4$, chromium(III) acetylacetonate and HgS were mixed and then pellets were produced from extruding the mixture. The extruding process was repeated two more times. These master pellets produced were mixed with commercial ABS resin and the extruding process was repeated three times.

NMIJ Analysts

The technical and production manager was A. Hioki and the analyst was M. Ohata.

Technical Information

If important changes on this CRM including any change of certified values happen, it will be informed to the customers. Technical information on this CRM will be obtained from the home page and the other contact routes (*vide infra*).

Reproduction of Certificate

In case of producing a duplicate of this certificate, the fact of reproduction should be clearly indicated on it.

December 19, 2006

Hiroyuki Yoshikawa
President,
National Institute of Advanced Industrial Science and Technology

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If you have any questions about this CRM, please contact
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