



**Approved by General Administration of Quality Supervision,**

**Inspection and Quarantine of the People's Republic of China**

**GBW08404-GBW08405**

## **Certificate of Certified Reference Material**

**Cd、 Cr、 Hg and Pb in Polypropylene**

**Sample Number:**

**Date of Certification:**

**National Institute of Metrology (NIM)**

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## 1. Description of Material & Intended Use

According to the restriction index of RoHS, this certified reference material (CRM) supplied as a set including a blank, a high and a low concentration level sample, is intended for evaluation of analytical methods, quality control in the process of analysis, characterization of unknown sample and arbitration inspection of relative samples.

## 2. Preparation

The candidate of this reference material is prepared by spiking in matrix method and it fulfils the requirements with respect to homogeneity, stability and property value level.

## 3. Traceability and certification

According to the requirement of national criterion for primary certified reference materials, the property values for Cd, Hg and Pb were determined using isotope dilution - mass spectrometry (ID-MS) method, which is considered as a potential primary method and has been validated through international comparison with NMIJ and KRISS and national measurement network of several laboratories. And for Cr element, it was determined through the measurement by a network of several laboratories.

The traceability of the certified value is ensured by using measurement methods and measuring instruments that meet the requirements of metrology.

## 4. Certified value and uncertainty

The certified value and the expanded uncertainty of the CRM are as follows:

Property	GBW08404 ( PP-L)		GBW08405 ( PP-H)	
	Certified value mg·kg <sup>-1</sup>	Expanded uncertainty / mg·kg <sup>-1</sup> , k=2	Certified value mg·kg <sup>-1</sup>	Expanded uncertainty / mg·kg <sup>-1</sup> , k=2
Cd	9.26	0.22	92.3	1.7
Cr	98.4	3.4	978	24
Hg	93.0	2.2	922	20
Pb	98.2	3.3	981	11

Contributions from characterization method, homogeneity and stability were considered in uncertainty evaluation of these reference materials.

## 5. Homogeneity and Stability Testing

According to the requirement of national criterion for primary certified reference materials, the

homogeneity testing for this reference material was carried out through random sampling by using ICP-AES method. The *F*-test method was used for homogeneity testing and no statistically significant difference among bottles was observed. The reference material is in good homogeneity. The minimum sample intake of this reference material is 0.1g.

The stability testing for this certified reference material was implemented and the measurement results fluctuated in the range of the uncertainty. It showed that the reference material is well stable.

The valid period of this CRM is three years from the date of certification. The stability of this RM is regularly monitored by NIM. Any change of the certified value during this period will be informed to the customers in time.

## 6. Instructions for use

- This certified reference material, supplied as a set including a blank, a high and a low concentration level, is sealed up in brown glass vials and each vial contains about 30g of the CRM.
- This certified reference material should be kept in the dark at room temperature.
- It should be prevented from contamination while opening and using. The minimum sample intake recommended is not less than 0.1g.

## 7. Co-operating analysis

Korea Research Institute of Standards and Science, KRISS

National Metrology Institute of Japan, NMIJ

Technical Center for Inspection & Quarantine of Guangdong Exit-Entry Inspection & Quarantine Bureau

Beijing Exit-Entry Inspection & Quarantine Bureau

National Institute of Measurement and Testing Technology

General Research Institute for Nonferrous Metal

Nanjing Institute of Geology and Mineral Resources

Guangzhou Kingfa Science & Technology Limited Company

## STATEMENT

1. The CRM is limited to the use of scientific research and analytical measurement. NIM is not responsible for any loss caused by improper use and storage of the CRM by the customer. Any compensate can only cover CRM itself.

2. Please check the status of reference materials as soon as the sample arriving. The certificate is only valid with the whole file and special stamp for NIM RM distribution. Please keep the integrity of the certificate.

3. If more information related to the use of the CRM is needed, please contact the technical enquiries section.