IRMM

Institute for Reference Materials and Measurements

CERTIFICATE
SPIKE ISOTOPIC REFERENCE MATERIAL IRMM-625

$1.442\,33\,(90) \cdot 10^{-4}$ mol (^{52}Cr) · kg^{-1} (solution)

The Spike Isotopic Reference Material is supplied with an isotope amount content of ^{52}Cr certified as above.

The amount of other chromium isotopes present are related to the ^{52}Cr content through the following certified amount ratios**:**

$n(^{50}Cr)/n(^{52}Cr)$:	0.051 85(20)
$n(^{53}Cr)/n(^{52}Cr)$:	0.113 33(38)
$n(^{54}Cr)/n(^{52}Cr)$:	0.028 35(34)

This corresponds to an isotopic composition with the following abundances **:**

amount fraction (·100)		mass fraction (·100)	
$n(^{50}Cr)/n(Cr)$	4.344(16)	$m(^{50}Cr)/m(Cr)$	4.173(15)
$n(^{52}Cr)/n(Cr)$	83.786(38)	$m(^{52}Cr)/m(Cr)$	83.696(40)
$n(^{53}Cr)/n(Cr)$	9.495(30)	$m(^{53}Cr)/m(Cr)$	9.668(30)
$n(^{54}Cr)/n(Cr)$	2.375(28)	$m(^{54}Cr)/m(Cr)$	2.464(30)

The molar mass of chromium in this sample is 51.996 30(72) g·mol^{-1}

From the certified values, the following amount and mass contents are derived:

$1.721\,45(70) \cdot 10^{-4}$	mol (Cr) · kg^{-1} (solution)
$7.491\,5\,(46) \cdot 10^{-6}$	kg (^{52}Cr) · kg^{-1} (solution)
$8.950\,9\,(36) \cdot 10^{-6}$	kg (Cr) · kg^{-1} (solution)

B-2440 GEEL (Belgium)
Tel.: +32-(0)14-571 608 • Fax: +32-(0)14-571 863

03/2000

NOTES

1. All uncertainties indicated are expanded uncertainties $U = k \cdot u_c$ where u_c is the combined standard uncertainty estimated following the ISO/BIPM Guide to the Expression of Uncertainty in Measurement. They are given in parentheses and include a coverage factor k=2. They apply to the last two digits of the value. The values certified are traceable to the SI.

2. The Spike Isotopic Reference Material IRMM-625 comes in a flame-sealed quartz ampoule containing about 5 mL. The molarity is about 1 M HCl.

3. The molar masses, used in the calculations, are[1]

^{50}Cr : 49.946 049 5 (28) g·mol^{-1}
^{52}Cr : 51.940 511 5 (30) g·mol^{-1}
^{53}Cr : 52.940 653 4 (30) g·mol^{-1}
^{54}Cr : 53.938 884 6 (30) g·mol^{-1}

4. This Spike Isotopic Reference Material is traceable to the SI in the shortest possible way. Measurements calibrated against these Isotopic Reference Materials have therefore the potential of being traceable to the SI.

The isotopic measurements required were performed by M Berglund, D Liesegang and M Ostermann using thermal ionization mass spectrometry (TIMS). The calibration was done using the isotopic reference material IRMM-012.

The chemical preparation was done by D Liesegang. B Dyckmans-Van Hout performed the metrological weighings required in the preparation and certification work. The ampoulation of this Spike Isotopic Reference Material was accomplished by G Van Baelen, M Ostermann, D Liesegang and M Berglund.

M Berglund co-ordinated the work leading to the establishment, certification and issuance of this Isotopic Reference Material. A Verbruggen was responsible for the preparation and issuance of the certificate.

B-2440 GEEL
March 2000

Dr P Taylor
IRMM Isotope Measurements

[1] G. Audi and A.H. Wapstra, The 1993 atomic mass evaluation , Nucl Phys A565 (1993) 1-65.