



EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

Institute for Reference Materials and Measurements (Geel)

CERTIFIED REFERENCE MATERIAL BCR-098

CERTIFICATE OF ANALYSIS

ZIRCALOY-4			
	Mass Fraction		Number of accepted sets of data p
	Certified value ¹⁾	Uncertainty	
Cr	906 $\mu\text{g/g}$	9 $\mu\text{g/g}^{2)}$	12
Fe	2.143 mg/g	0.020 $\text{mg/g}^{2)}$	12
Hf	77.6 $\mu\text{g/g}$	3.0 $\mu\text{g/g}^{3)}$	4
Sn	14.60 mg/g	0.09 $\text{mg/g}^{2)}$	13

¹⁾ Unweighted mean value of the mean of p sets of data, each set being obtained in a different laboratory and/or with a different method. The certified values are traceable to the International System of Units (SI).
²⁾ Calculated as the 95 % confidence interval of the certified mean value as defined in 1).
³⁾ Calculated as the 95% confidence interval of the population of the data set mean values.

This certificate is valid for five years after purchase.

Sales date:

The minimum amount of sample to be used is 200 mg.

NOTE

This material has been certified by BCR (Community Bureau of Reference, the former reference materials programme of the European Commission). The certificate has been revised under the responsibility of IRMM.

Brussels, May 1987

Latest revision: August 2015

Signed: 
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DESCRIPTION OF THE SAMPLE

The material is available in the form of chips (1 bottle contains approximately 10 g).

ANALYTICAL METHOD USED FOR CERTIFICATION

- Atomic absorption spectrometry
- Inductively coupled plasma optical emission spectrometry
- Instrumental neutron activation analysis
- Isotope dilution mass spectrometry
- Redox titration
- Spectrophotometry

PARTICIPANT

- Atomic Energy Research Establishment, Harwell (GB)
- Bundesanstalt für Materialforschung und –prüfung, Berlin (DE)
- Central Bureau for Nuclear Measurements, Geel (BE)
- Commissariat à l’Energie Atomique, Fontenay-aux-Roses (FR)
- Compagnie Européenne du Zirconium CEZUS, Albertville (FR)
- ENEA (Comitato Nazionale per la ricerca e per lo sviluppo dell’Energia Nucleare e delle Energie Alternative), Roma (IT)
- Energieonderzoek Centrum Nederland, Petten (NL)
- Gesellschaft für Systemtechnik, Essen (DE)
- Instituut voor Nucleaire Wetenschappen (R.U.G.), Gent (BE)
- Kraftwerk Union, Erlangen (DE)
- Kernforschungsanlage Jülich, Jülich (DE)
- Metallwerk Plansee, Reutte (AT)
- Queen’s University, Belfast (GB)
- Risø National Laboratory, Roskilde (DK)
- Studiecentrum voor Kernenergie, Mol (BE)
- Universität Regensburg, Regensburg (DE)
- Universität Ulm, Ulm (DE)

SAFETY INFORMATION

Not applicable.

INSTRUCTIONS FOR USE

Etching is not required if the material is used immediately after opening the bottle. The material is intended for calibration or quality control.

STORAGE

The material has been packed under argon to prevent oxidation. It might be stored at 18 °C and in a dried atmosphere. However, the European Commission cannot be held responsible for changes that happen during storage of the material at the customer’s premises, especially of opened samples.

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NOTE

A technical report on the production of BCR-098 is available on the internet (<http://www.irmm.jrc.be>). A paper copy can be obtained from IRMM on request.