

Preliminary

Product Information Sheet

Microanalytical Reference Material

BIR-1a*-NP

Nano-particulate pressed powder pellet

Reference Values

Analyte	Value	Uncertainty (95% CL)	Unit	Analyte	Value	Uncertainty (95% CL)	Unit
Na ₂ O	1.832	0.022	g/100g	Cd	0.077	0.017	µg/g
MgO	9.689	0.052	g/100g	Sn	0.701	0.067	µg/g
Al ₂ O ₃	15.51	0.07	g/100g	Sb	0.462	0.032	µg/g
SiO ₂	47.79	0.16	g/100g	Cs	0.00646	0.00072	µg/g
P ₂ O ₅	0.03	0.0043	g/100g	Ba	6.75	0.13	µg/g
K ₂ O	0.029	0.003	g/100g	La	0.627	0.012	µg/g
CaO	13.29	0.06	g/100g	Ce	1.92	0.023	µg/g
TiO ₂	0.9587	0.0066	g/100g	Pr	0.3723	0.0047	µg/g
MnO	0.1731	0.0016	g/100g	Nd	2.397	0.043	µg/g
Fe ₂ O ₃ (t)	11.4	0.05	g/100g	Sm	1.113	0.018	µg/g
Li	3.203	0.069	µg/g	Eu	0.5201	0.0047	µg/g
Be	0.102	0.011	µg/g	Gd	1.809	0.021	µg/g
Sc	43.21	0.59	µg/g	Tb	0.3623	0.005	µg/g
V	320.6	2.9	µg/g	Dy	2.544	0.028	µg/g
Cr	392.9	3.9	µg/g	Ho	0.5718	0.0047	µg/g
Co	52.22	0.57	µg/g	Er	1.68	0.015	µg/g
Ni	168.9	1.9	µg/g	Tm	0.2558	0.004	µg/g
Cu	120.7	1.6	µg/g	Yb	1.631	0.015	µg/g
Zn	70.4	1.1	µg/g	Lu	0.2484	0.0032	µg/g
Ga	15.46	0.23	µg/g	Hf	0.5822	0.0088	µg/g
Rb	0.21	0.0081	µg/g	Ta	0.0414	0.002	µg/g
Sr	108.6	0.7	µg/g	W	0.027	0.015	µg/g
Y	15.6	0.17	µg/g	Tl	0.0021	0.0007	µg/g
Zr	14.8	0.22	µg/g	Pb	3.037	0.049	µg/g
Nb	0.553	0.014	µg/g	Th	0.0328	0.0015	µg/g
Mo	0.068	0.021	µg/g	U	0.01051	0.00041	µg/g

Information Values

Analyte	Value	Uncertainty (95% CL)	Unit	Analyte	Value	Uncertainty (95% CL)	Unit
B	0.25		µg/g	S	70		µg/g
F	55		µg/g	Cl	44		µg/g
				Ge	1.46	0.098	µg/g

Analyte	Value	Uncertainty (95% CL)	Unit	Analyte	Value	Uncertainty (95% CL)	Unit
As	0.17	0.14	μg/g	I	0.014		μg/g
Se	0.019	0.012	μg/g	Re	0.00065		μg/g
Br	0.065		μg/g	Os	0.00038		μg/g
Ru	0.00037		μg/g	Ir	0.00018	0.00004	μg/g
Rh	0.00034		μg/g	Pt	0.0046	0.0009	μg/g
Pd	0.006	0.0011	μg/g	Au	0.0025		μg/g
Ag	0.041		μg/g	Hg	0.0073		μg/g
In	0.0576	0.0028	μg/g	Bi	0.0051	0.0014	μg/g
Te	0.0057	0.0024	μg/g				

All values are the present best estimates of the true content for each element in the original powder. These values are taken from the GeoReM database. The databases' curator K.-P. Jochum evaluated 4075 analysis in order to "re-certify" the material based on a statistically more solid basis than the original data sheet. The values do have a higher likelihood of being true/accurate, in an analytical sense. Information values did not fulfil all necessary statistical criteria of a reference value and should neither be considered for calibration nor validation.

*The original manufacturer (USGS) is not liable for any issues occurring from the use of this material since they took no part in the manufacturing of the pellets.

Intended Use

This microanalytical reference material (MRM) is designed for use by laboratories undertaking the determination of major and trace element mass fractions in basalt and equivalent matrices with LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectrometry), μXRF/XRF (Micro X-ray Fluorescence Spectroscopy) and LIBS (Laser-Induced Breakdown Spectroscopy). It is suitable for calibration and as a secondary reference material for the assessment of a measurement procedure and quality control. Note that the material may only be used for a single purpose in the same measurement process. For example, it must not be used for calibration and method validation at the same time.

Description of the MRM

This MRM is a nanoparticulate pressed powder pellet of the basalt powder "BIR-1a". The original powder, purchased from the United States Geological Survey (USGS), was subjected to our own material-specific milling protocol and pressed without any binders using a programmable hydraulic press. The fortification of contrasting colour surrounding the reference material is, according to the manufacturer, an "organic compound". The exact composition is not specified any closer. The certificate of analysis is available on demand.

Handling advice and Storage

Avoid touching the pellet's surface directly in order to prevent contamination. Also, do not clean the surface with any liquids as it may compromise the pellet's integrity.

Please note the label marks the bottom of the pellet.

If using a pressed pellet not ordered specifically for μXRF and or XRF please consider the sample thickness. Store the MRM in a desiccator and or in a dark and dry environment.

The myStandards GmbH cannot be held responsible for changes that happen during storage of the material at the customer's premises, especially with respect to opened samples.

Period of Validity

Provided the storage and handling conditions are met, no chemical alteration is known to exist, and the assigned values will remain stable. Therefore, the product information and assigned values for this MRM are valid for one year from the date of dispatch. This validity may be extended as further evidence of stability becomes available. The manufacturer will inform the customer if any alterations occur.

Date of dispatch: {LIEFERDATUM}

Safety instructions

Nano-particulate powders can cause harm if ingested, inhaled or in contact with skin. In their pressed form however, they do not exhibit any dusting. If a pellet should accidentally break, we advise wearing a dust mask during clean up.

Further Information

This MRM has been produced in accordance with the recommendations specified in ISO Guides 30 to 35. Due to processing a part of the sample material may be seen on the fortification, this does not reduce the performance of the MRM. Please refrain from using this part of the pellet.

The pellets are sold exclusively via the myStandards GmbH and authorised subcontractors.

Pellet serial number: {SERIENNUMMER}

Manufactured for: {METHODE}

Size: {GROESSE}

Document History

<i>Version</i>	<i>Date</i>	<i>Changes applied</i>
1.0	21.01.2019	First publication
1.1	24.04.2019	Changed Description of Assigned Values, Description of the MRM, Handling advice and Storage, Period of Validity and Further Information; Insert footnote to Legal notice; Added Document History
2.0	05.11.2020	Changed Description of the MRM, Handling advice and Storage, Further Information, Intended Use (adding LIBS, XRF and calibration) and Period of Validity (including changing date of manufacturing to date of dispatch); Addition of new terms and conditions; Updated document structure, Addition of individual Pellet characteristics
3.0	23.06.2022	New official letterhead
4.0	04.04.2023	Updated link to terms and conditions; Adaptation to automatically fill in the date and individual pellet characteristics

References

Jochum K.-P. et al. 2016. Reference Values Following ISO Guidelines for Frequently Requested Rock Reference Materials. *Geostandards and Geoanalytical Research* 40(3):333-350.

Legal notice

Our order, sales and delivery conditions apply. The valid version of our general terms and conditions (status 01.09.2019) - can be found on our website: <https://www.my-standards.com/terms-and-conditions/>. They are also available on request.