myStandards GmbH
Schauenburger Straße 116
24118 Kiel
Germany

Preliminary

Product Information Sheet

Microanalytical Reference Material

FeMn-1*-NP

Nano-particulate pressed powder pellet

Reference Values

Analyte	Value	Uncertainty (95% CL)	Unit
MgO	2.82	0.06	g/100g
CaO	2.50	0.05	g/100g
Li	299	11	µg/g
Rb	12.2	0.6	µg/g
Sr	680	15	µg/g
Y	69.4	2.2	µg/g
Zr	323	9	µg/g
Nb	13.2	0.3	µg/g
Cs	0.82	0.06	µg/g
La	68.1	1.7	µg/g
Ce	110	4	µg/g
Pr	14.1	0.5	µg/g
Nd	63.0	1.7	µg/g
Sm	14.1	0.3	µg/g

Analyte	Value	Uncertainty (95% CL)	Unit
Eu	3.82	0.25	µg/g
Gd	15.6	0.6	µg/g
Tb	2.52	0.10	µg/g
Dy	15.9	0.5	µg/g
Ho	3.42	0.11	µg/g
Er	9.81	0.30	µg/g
Tm	1.52	0.12	µg/g
Yb	10.1	0.3	µg/g
Lu	1.59	0.05	µg/g
Hf	4.74	0.12	µg/g
Pb	126	5	µg/g
Th	6.80	0.25	µg/g
U	4.49	0.15	µg/g

Information Values

Analyte	Value	Uncertainty (95% CL)	Unit
Al2O3	2.92	0.08	g/100g
SiO2	10.40	0.2	g/100g
P2O5	0.352	0.012	g/100g
TiO2	0.285	0.014	g/100g
MnO	44.21	0.63	g/100g
Fe2O3(t)	8.67	0.22	g/100g
Be	1.49	0.21	µg/g
Sc	7.58	0.84	µg/g
V	469	27	µg/g
Co	475	16	µg/g
Ni	13100	275	µg/g

Analyte	Value	Uncertainty (95% CL)	Unit
Cu	5890	175	µg/g
Zn	1885	60	µg/g
As	74.5	5.1	µg/g
Mo	572	16	µg/g
Cd	19.8	1.5	µg/g
Sb	60.8	3.8	µg/g
Ba	3165	110	µg/g
Ta	0.26	0.04	µg/g
Tl	129	7	µg/g
Bi	3.42	0.44	µg/g

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

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All values including their uncertainties are taken from the reference material data sheet for the original powder. Information values did not fulfil all necessary statistical criteria of a reference value and should neither be considered for calibration nor validation.

Pellet serial number:	**{SERIENNUMMER}**
Manufactured for:	**{METHODE}**
Size:	**{GROESSE}**
Date of dispatch:	{LIEFERDATUM}

Intended Use

This microanalytical reference material (MRM) is designed for use by laboratories undertaking the determination of major and trace element mass fractions in manganese nodule 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 nanoparticular pressed powder pellet of the manganese nodule powder "FeMn-1". The original powder, purchased from the International Association of Geoanalysts (IAG), 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.

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 accidently 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.

Document History

Version	*Date*	*Changes applied*
1.0	14.12.2022	First publication
1.1	04.04.2023	Adaptation to automatically fill in the date and individual pellet characteristics

References

Potts P.J., Webb P.C. Reference Material Data Sheet, Reference Material Data Sheet IAG FeMn-1 Manganese Nodule, 2020, available online at www.iageo.com.