

Preliminary
Product Information Sheet
Microanalytical Reference Material
NFHS-2-NP

Nano-particulate pressed powder pellet

Calcium Reference Value

| Analyte | Value | Uncertainty (95% CL) | Unit |
|---------|-------|----------------------|--------|
| Ca | 38.53 | 0.61 | g/100g |

Reference Values

| Analyte | Value | Uncertainty (95% CL) | Unit | Analyte | Value | Uncertainty (95% CL) | Unit |
|---------|-------|----------------------|------|---------|-------|----------------------|------|
| Li | 1.63 | 0.15 | µg/g | Ce | 1.5 | 0.1 | µg/g |
| B | 7.7 | 0.8 | µg/g | Pr | 0.46 | 0.04 | µg/g |
| Na | 1195 | 52 | µg/g | Nd | 1.90 | 0.09 | µg/g |
| Mg | 637 | 28 | µg/g | Sm | 0.378 | 0.004 | µg/g |
| Sc | 0.44 | 0.05 | µg/g | Eu | 0.09 | 0.01 | µg/g |
| Mn | 87 | 4 | µg/g | Gd | 0.44 | 0.06 | µg/g |
| Co | 0.71 | 0.05 | µg/g | Tb | 0.07 | 0.01 | µg/g |
| Ni | 1.64 | 0.11 | µg/g | Dy | 0.44 | 0.02 | µg/g |
| Cu | 6.4 | 0.3 | µg/g | Ho | 0.100 | 0.001 | µg/g |
| Zn | 15.9 | 1.5 | µg/g | Er | 0.30 | 0.01 | µg/g |
| Ga | 0.19 | 0.02 | µg/g | Tm | 0.040 | 0.001 | µg/g |
| Rb | 1.36 | 0.06 | µg/g | Yb | 0.248 | 0.005 | µg/g |
| Sr | 1190 | 45 | µg/g | Lu | 0.040 | 0.005 | µg/g |
| Y | 3.9 | 0.2 | µg/g | Pb | 1.65 | 0.05 | µg/g |
| Cd | 0.163 | 0.009 | µg/g | Th | 0.136 | 0.006 | µg/g |
| Sn | 0.29 | 0.02 | µg/g | | | | |
| Cs | 0.08 | 0.01 | µg/g | | | | |
| Ba | 76 | 1 | µg/g | | | | |
| La | 2.43 | 0.11 | µg/g | | | | |

Information Values

| Analyte | Value | Uncertainty (95% CL) | Unit | Analyte | Value | Uncertainty (95% CL) | Unit |
|---------|-------|----------------------|------|---------|-------|----------------------|------|
| Al | 641 | 45 | µg/g | V | 1.20 | 0.19 | µg/g |
| Ti | 39.4 | 1.2 | µg/g | Cr | 1.3 | 0.2 | µg/g |
| Si | 4889 | 149 | µg/g | Fe | 532 | 36 | µg/g |
| P | 90.7 | 7.8 | µg/g | Zr | 2.47 | 0.77 | µg/g |
| S | 244 | 45 | µg/g | Hf | 0.05 | 0.03 | µg/g |
| K | 205 | 11 | µg/g | U | 0.12 | 0.03 | µg/g |

All values are the present best estimates of the true content for each element in the nano-particulate powder. The powder was characterized using ICP-MS, ICP-OES, GC-MS, TIMS, ICP-MC-MS, ID-MS and XRF. The uncertainty is calculated as a 95% confidence level with expansion factor $k=2$.

Isotopic Reference Values

| Analyte | Value | Uncertainty (95% CL) |
|---------------------|----------|-------------------------|
| $^{87/86}\text{Sr}$ | 0.709163 | 0.000008 |

Isotopic Information Values

| Analyte | Value | Analyte | Value |
|---------------------------|---------|-----------------------|----------|
| $\delta^{25/24}\text{Mg}$ | -1.898 | $^{207/204}\text{Pb}$ | 15.591 |
| $\delta^{26}\text{Mg}$ | -3.6845 | $^{208/206}\text{Pb}$ | 2.115065 |
| $^{208/207}\text{Pb}$ | 2.4215 | $^{232/230}\text{Th}$ | 51200 |
| $^{207/206}\text{Pb}$ | 0.87306 | $^{238/235}\text{U}$ | 139 |
| $^{206/204}\text{Pb}$ | 17.8578 | $^{235/234}\text{U}$ | 100 |
| $^{208/204}\text{Pb}$ | 37.770 | $\delta^{11}\text{B}$ | 15.64 |
| $\delta^{13}\text{C}$ | 0.79 | $\delta^{18}\text{O}$ | -0,04 |

All values are the present best estimates of the true content for each element in the nano-particulate powder. The uncertainty is calculated as a 95% confidence level with expansion factor $k=2$.

Intended Use

This microanalytical reference material (MRM) is designed for use by laboratories undertaking the determination of major and trace element mass fractions in carbonate and equivalent matrices with LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectrometry), $\mu\text{XRF/XRF}$ (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 carbonate powder "NFHS-2-NP". The starting material is an aliquot, provided by The Royal Netherlands Institute for Sea Research (NIOZ), of NFHS-1 (NIOZ Foraminifera House Standard). It stems from a calcareous ooze collected at the Walvis Ridge (SE Atlantic) at 2878 m of water depth. It consists purely out of foraminifera. The powder was produced in cooperation with the myStandards GmbH and NIOZ and 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, pending further stability data. 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:

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:

Manufactured for:

Size:

Document History

| Version | Date | Changes applied |
|---------|------------|-------------------|
| 1.0 | 17.02.2021 | First publication |

References

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/en/terms-and-conditions>. They are also available on request.

