myStandards GmbH
Schauenburger Straße 116
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**Preliminary**

# Product Information Sheet

Microanalytical Reference Material

# SCC-05-NP

Nano-particulate pressed powder pellet

**Reference Values**

| Analyte | Value | Uncertainty (95% CL) | Unit | k | Method |
|---|---|---|---|---|---|
| Ca | 39.10 | 0.29 | g/100g | 3.182 | A |
| Li | 228 | 24 | µg/g | 3.182 | C, D, E, F |
| B | 66.8 | 11.5 | µg/g | 3.182 | C, D, E, F |
| Mg | 173 | 19 | µg/g | 2.776 | A, C, D, E, F |
| Al | 44 | 22 | µg/g | 4.303 | C, D, E |
| K | 114 | 25 | µg/g | 4.303 | C, D, F |
| Cr | 118 | 21 | µg/g | 3.182 | A, C, E, F |
| Mn | 122 | 26 | µg/g | 2.776 | A, C, D, E, F |
| Fe | 123 | 31 | µg/g | 4.303 | C, E, F |
| Co | 116 | 8 | µg/g | 2.776 | A, B, C, D, F |
| Ni | 117 | 8 | µg/g | 2.776 | A, B, C, D, F |
| Cu | 126 | 19 | µg/g | 3.182 | A, C, D, F |
| Zn | 119 | 11 | µg/g | 2.776 | A, C, D, E, F |
| Sr | 6704 | 286 | µg/g | 2.571 | A, B, C, D, E, F |
| Cd | 118 | 15 | µg/g | 4.303 | C, D, F |
| In | 119 | 26 | µg/g | 12.71 | C, D |
| Ba | 119 | 7 | µg/g | 2.571 | A, B, C, D, E, F |
| Pb | 116 | 13 | µg/g | 2.776 | A, C, D, E, F |
| Bi | 107 | 24 | µg/g | 3.182 | A, C, D, F |

**Information Values**

| Analyte | Value | Unit | Method |
|---|---|---|---|
| Na | 6433 | µg/g | C, D, E, F |
| Si | 5080 | µg/g | A, C, F |
| Ag | 54 | µg/g | C, F |
| Tl | 13 | µg/g | C, D, F |

The assigned values represent the mean of laboratory means. The reference values were obtained through measurements performed on the nano-powder using methods A, B, C, D, E and or F in atleast two competent laboratories based on the characterisation approaches “Characterisation of a non-operationally defined measurand using two or more methods of demonstrable accuracy in one or more competent laboratories”.

List of analytical methods used for characterisation:

A Wavelength-dispersive X-ray spectroscopy (WD-XRF) analysis following Lithium Borate Fusion
B Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) analysis following Lithium Borate Dissolved Bead
C Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) analysis following Lithium Borate Fusion
D Quadrupol Inductively Coupled Plasma-Mass Spectroscopy (Q-ICP-MS) analysis following Multi-Acid Digestion
E Sector Field Inductively Coupled Plasma-Mass Spectroscopy (SF-ICP-MS) analysis following Multi-Acid Digestion
F Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) analysis following Acid Digestion

Further, each laboratory's performance was statistically evaluated following recommendations from ISO Guide 35[1].
Homogeneity and stability tests were performed on the nano-pellets using LA-ICP-MS and in accordance with ASTM E826-14[2], ISO 13528[3], and ISO Guide 35.

The expanded uncertainty is composed of the uncertainty components from characterisation, as well as from the homogeneity, and stability. Unless stated otherwise a coverage factor k = 2 was applied to reach a confidence level of 95 %, as defined in the Guide to the Expression of Uncertainty in Measurement (GUM)[4].

Information values did not fulfil all necessary statistical criteria of a reference value and should neither be considered for calibration nor validation. The information values, which have an uncertainty were demoted due to the calculated combined expanded uncertainty not being usable and or due to insufficient characterisation.

**Pellet serial number: {SERIENNUMMER}**

Date of dispatch: {LIEFERDATUM}

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**Intended Use**

This microanalytical reference material (MRM) is designed for use by laboratories undertaking the determination of major and trace element mass fractions in calcium carbonate ($CaCO_3$) and equivalent matrices with LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectrometry). 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 calcium carbonate (CaCO3) powder "SCC-05-NP". The powder was precipitated from elementally doped solutions of calcium chloride ($CaCl_2$) and sodium carbonate ($Na_2CO_3$), washed with deionised water (18,2 MΩ) and subjected to a 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.
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, pending stability monitoring, 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.

**Minimal sample size**

The minimal sample size corresponds to a spot size of 55 µm.
Further ablation conditions and signal acquisition parameters during homogeneity- and stability-testing were:

| | |
|---|---|
| *Laser fluence* | *5 J/cm²* |
| *Repetition rate* | *15 Hz* |

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**Further Information**

A detailed report on the characterisation of the reference material is available on request or can be downloaded from www.my-standards.com.

Sample handling prior to pelletising is performed manually. Therefore, small amounts of the sample material may be seen on the fortification, this does not reduce the integrity of the MRM. Please refrain from using this part of the pellet.
The pellets are sold exclusively via the myStandards GmbH and authorised subcontractors.

List of participating laboratories:

- Louisiana State University
- Southwest Petroleum University
- St. Mary's University
- Université du Québec à Chicoutimi (UQAC)
- University of Lund
- University of Texas at Austin
- NIOZ Royal Netherlands Institute for Sea Research
- Eurofins EAG Laboratories
- Bundesanstalt für Geowissenschaften und Rohstoffe - Federal Institute for Geosciences and Natural Resources

**Document History**

| *Version* | *Date* | *Changes applied* |
|---|---|---|
| 1.0 | 22.07.2025 | First publication |
| 1.1 | 23.10.2025 | Change of Ca uncertainty based on WD-XRF data |

**References**

**[1] ISO Guide 35:2017 (E)**, *Reference materials – Guidance for characterization and assessment of homogeneity and stability*

**[2] ASTM E826-14**, *Standard Practice for Testing Homogeneity of a Metal Lot or Batch in Solid Form by Spark Atomic Emission Spectroscopy*. ASTM International, West Conshohocken, PA, 2014. www.astm.org

**[3] ISO 13528:2015 (E)**, *Statistical methods for use in proficiency testing by interlaboratory comparison*

**[4] ISO/IEC Guide 98-3:2008**, *Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

**[5] EN ISO 17034:2016 (D/E)**, *General requirements for the competence of reference material producers*