



Reference Material Data Sheet

IAG OU-3 Nanhoron Microgranite

International Association of Geoanalysts

13 Belvedere Close, Keyworth, Nottingham NG12 5JF, UK

e-mail iageo.ltd@ntlworld.com

Telephone +44 (0)115 9375219

Description of the reference material

IAG OU-3 (Nanhoron microgranite) was collected from Chwarel Nanhoron Quarry, Inkermann Bridge, Nanhoron, North Wales (UK grid reference SH 287 330) during May 1999. The sample comprised a fresh broken block from floor of quarry and was crushed, split and packaged and tested for homogeneity at the Open University using procedures described in previous GeoPT rounds.

Characterisation as a reference material

This material is characterised as a reference material using results from GeoPT06/2000 round of the International Association of Geoanalysts' GeoPT proficiency testing scheme. The Proficiency Testing Steering Committee for this round was Prof. M. Thompson (statistician), Prof. P.J. Potts (results coordinator) Jean S. Kane, Dr P.C. Webb and Dr J. Carignan. The GeoPT06 report was published at: <http://www.geoanalyst.org/geopt/GeoPT06-6AReport.pdf>.

Intended use

This reference material is designed for use by laboratories undertaking the determination of the major and trace element mass concentration fractions of silicate rocks and similar materials for the calibration of a measurement system, the assessment of a measurement procedure, assigning values to other materials, and quality control. Note that the material may be used only 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.

Minimum sample size

On the basis of the homogeneity results and an assessment of the methods used to contribute results to the GeoPT08-2001 round, the minimum sample size recommended for use as a test portion is 0.2 g.

Period of validity

Provided the storage and handling conditions are met, this reference material is not expected to deteriorate with time. On exposure to air, the material may absorb moisture, and instructions for handling must be followed.

Storage information

Store in a sealed container in a cool dry environment.

Instructions for handling

Before any measurements are made, every portion of the test sample must be dried at 105 ± 5 °C for at least 2 hours. Avoid contamination and cross-contamination of the test material.

IAG OU-3 Nanhoron Microgranite								
Reference values								
Measurand	Reference value	Uncertainty (expanded)	n		Measurand	Reference value	Uncertainty (expanded)	n
	g/100 g	g/100 g				mg/kg	mg/kg	
SiO ₂	74.20	0.13	63		Ho	4.04	0.17	25
TiO ₂	0.225	0.003	64		La	94.7	2.6	43
Al ₂ O ₃	11.11	0.05	66		Lu	1.64	0.06	28
Fe ₂ O ₃ T	3.84	0.03	67		Nb	80.7	2.2	50
Fe(II)O	3.25	0.06	17		Nd	87.2	1.3	38
MnO	0.090	0.002	68		Pb	36.2	1.3	52
Na ₂ O	3.67	0.04	69		Pr	22.8	0.7	28
K ₂ O	4.55	0.03	67		Rb	172	2	58
LOI	1.82	0.04	55		Sb	0.31	0.03	18
	mg/kg	mg/kg			Sm	18.8	0.5	32
Ba	28.5	1.5	49		Sr	11.2	0.5	60
Be	10.9	0.7	19		Ta	5.88	0.31	28
Ce	197	7	43		Tb	3.12	0.14	28
Cs	0.67	0.03	25		Th	22.9	0.7	49
Dy	19.0	0.8	25		Tm	1.75	0.09	21
Er	11.5	0.5	23		U	5.55	0.18	42
Eu	1.18	0.04	28		Y	114	3	55
Ga	32.1	0.6	37		Yb	11.4	0.4	31
Gd	18.3	0.6	23		Zn	149	3	59
Hf	23.2	0.7	30		Zr	945	16	57

Reference values are the GeoPT assigned values obtained from a re-assessment using robust statistical analysis of results originally submitted to the GeoPT06 round. This reassessment took into account more recent experience of GeoPT data evaluation, together with the opportunity to select median values as the reference value, when justified by the data distribution. Values are reported on a dried basis.

Uncertainties are the robust standard deviation of the mean or median of the assigned value expanded by a coverage factor of two, and rounded up.

Fe₂O₃T is the total iron expressed measured as Fe₂O₃; *Fe(II)O* is the ferrous iron mass fraction; *LOI* is the loss on ignition (nominally 1050 °C for 2 hours).

IAG OU-3 Nanhoron Microgranite								
Information values								
Measurand	Information value	Uncertainty (expanded)	n		Measurand	Information value	Uncertainty (expanded)	n
	g/100 g	g/100 g				mg/kg	mg/kg	
CaO	0.21	0.01	64		F	1100	73	11
CO ₂	1.91	0.01	11		Ge	1.5	0.3	11
	mg/kg	mg/kg			Li	1.5	0.3	13
As	3.0	0.5	22		Mo	2.0	0.2	27
Cr	19	2	54		Sn	12	2	22
Cu	3.7	0.8	36		Tl	0.74	0.12	10

Information values are 'provisional' values derived from the GeoPT06 dataset following a re-assessment of source data originally submitted to the GeoPT06 round. This reassessment took into account more recent experience of GeoPT data evaluation, together with the opportunity to select median values as information values, when justified by the data distribution. These data are provided for information purposes only and **not** for the calibration of methods or the assessment of data. Results are reports on a dried basis.

Uncertainties are the robust standard deviation of the median expanded by a coverage factor of two, and rounded up.

CO₂ is the total carbon mass fraction expressed as CO₂.

Assessment of reference values

The reference values were determined as a 'consensus', based on the statistical location of the participants' results to the GeoPT08-2001 round. This location was determined as a robust mean if the distribution of results was unimodal and, outliers aside, close to symmetrical. If a slight asymmetry was apparent in a unimodal distribution, the median was chosen as an alternative. In other circumstances, usually when the number of valid results contributing to the location was less than 12 or their dispersion was unusually great, no reference value was assigned, although values may be reported as information values. These judgements were made by the IAG Proficiency Testing Steering Committee.

Metrological traceability

Traceability was not formally demonstrated for this reference material. However, traceability could be demonstrated by the use of certified reference materials as calibrators or for performance assessment by the laboratories participating in this round (although this information is not currently recorded by the GeoPT programme). Furthermore, traceability is implied by the overall agreement between datasets for individual elements/oxides submitted by laboratories that contributed to the GeoPT programme.

Reference to reference material characterisation report

Further details of the procedures used, the results, their statistical analysis and assessment, on which the property values listed in this certificate are based, can be found in the GeoPT06-2000 report (<http://www.geoanalyst.org/index.php/proficiency-testing-proficiency-testing/geopt-programme/previous-rounds>).

Safety information

Silicate powders containing heavy metals can cause harm especially if inhaled or in contact with the skin. User organisations must undertake a health and safety risk assessment and ensure that the appropriate procedures are followed in the handling and use of this material. Further details are available on the relevant Material Safety Data Sheet.

Legal notice – terms and conditions

1. The IAG shall not be liable to the user of this material for loss (whether direct or indirect) of profits, business, anticipated savings or reputation or for any indirect or consequential loss or damage whatsoever even if previously advised thereof and whether arising from negligence, breach of these Terms and Conditions or howsoever occurring.
2. In any event, and notwithstanding anything contained in these Terms and Conditions, IAG's liability in contract, tort (including negligence, defamation or breach of statutory duty) or otherwise arising by reason of or in connection with these Terms and Conditions (including as a result of proficiency testing) shall be limited to the price paid for the material giving rise to such liability.
3. The IAG does not grant any warranties in relation to GeoPT products or the supply of analytical services or distribution of the proficiency test, and all other conditions, warranties, stipulations or other statements whatsoever, whether express or implied, by statute, at common law or otherwise howsoever, relating to the GeoPT products, analytical services or proficiency tests are hereby excluded. In particular, (but without limitation to the foregoing) no warranties are granted regarding the fitness for purpose, performance, use, quality or merchantability of the GeoPT products, whether express or implied, by statute, at common law or otherwise howsoever.

Revisions

Any revisions to this reference material data sheet will be made available on the IAGeo Ltd web site (www.iageo.com).

Acknowledgements

Peter Webb is gratefully acknowledged for undertaking a re-assessment of the GeoPT06 data set and for other contributions to this data sheet.

Approvals

This reference material information sheet was approved on behalf of the Certification and Reference Material Committee of the International Association of Geoanalysts.

Name Philip J. Potts

Position Chair of IAG Certification
and Reference Material Committee

Date 29th February 2016

©2016 International Association of Geoanalysts.