

Certificate of Analysis

Reference Material OxA26

Recommended Gold Concentration: 0.0798 +/- 0.0056 µg/g

The above values apply only to product in jars or sachets which have an identification number within the following range: *(The unique number range is not published on website)*

Prepared and Certified By:

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Date of Certification:

11 September 2002

Certificate Status:

Original. Future revisions (if any) will be notified on our website – www.rocklabs.com

Available Packaging:

This reference material has been packed in wide-mouthed jars that contain 2.5kg of product. The contents of some jars may be subsequently repacked into sealed polyethylene sachets.

Origin of Reference Material:

Feldspars with minor quantities of finely divided gold-containing minerals that have been screened to ensure there is no gold nugget effect.

Supplier of Reference Material:

ROCKLABS Ltd
P O Box 18 142
Auckland
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Email: rocklabs@clear.net.nz
Telephone: +64 9 634 7696
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Description:

The component minerals have been well mixed and a homogeneity test carried out after the entire batch was packaged into wide-mouthed jars to ascertain that the gold is evenly distributed throughout the reference material. There is

no soil component. The product contains crystalline quartz and therefore dust from it should not be inhaled.

The approximate chemical composition is:
(Uncertified Values)

	%
SiO ₂	67.27
Al ₂ O ₃	18.99
Na ₂ O	9.91
K ₂ O	1.30
CaO	0.27
MgO	0.09
TiO ₂	0.04
MnO	<0.01
P ₂ O ₅	0.10
Fe ₂ O ₃	0.62
L O I	0.53

Intended Use: This reference material is designed to be included with every batch of samples analysed and the results plotted for quality monitoring purposes.

Stability: The container (jar or sachet) and its contents should not be heated to temperatures higher than 50 °C. The reference material is stable, with weight changes of less than 0.4% at extremes of naturally occurring temperature and humidity conditions.

Instructions for Use: Weigh out quantity usually used for analysis and analyze for total gold by normal procedure. Homogeneity testing has shown that consistent results are obtainable for gold when 30g portions are taken for analysis. Homogeneity cannot be guaranteed for gold if smaller weights are taken for analysis.

Method of Preparation: A concentrate of finely pulverized and screened, gold-containing minerals was quantitatively diluted by blending with pulverized feldspar minerals. Once the powders were uniformly mixed the composite was placed into 749 wide-mouthed jars, each bearing a unique number. 30 jars were randomly selected from the packaging run and material from these jars was used for homogeneity testing.

Homogeneity Test: 30g portions were selected as follows for homogeneity testing by an independent laboratory.

Between Jar - Samples from the top of each of the 30 randomly selected jars.

Within Jar - The contents of three jars were compacted by vibration (to simulate the effect of freighting) and five samples removed successively from top to bottom from each of the three jars.

Reference Group - 12 homogeneous sub-samples (ie a control group) were prepared from one jar by taking approximately 400g and mixing by mat rolling, followed by coning and quartering to obtain 30g (approximate) portions for gold analysis.

Statistical analysis of the data indicated no significant difference in variability between the *Reference Group* and each of the other groups of samples at the 0.05 level of significance. The results from the 45 jar samples had a coefficient of variation of 5.2%. As the homogeneity testing was carried out using 30g analytical portions, the same degree of homogeneity cannot be guaranteed if smaller weights are taken for analysis.

Analytical Methodology:

The gold value was assigned to this reference material through the use of a single primary (definitive) method as described in section a) 5.14 of ISO Guide 34:2000(E) *General Requirements for the Competence of Reference Material Producers*. We believe this has the potential to be a superior method of characterization, compared to consensus testing, for candidate reference materials that have a low gold concentration. The single primary method used was a corrected gravimetric fire assay procedure. This is a normal gravimetric fire assay in which the gold remaining in the slag, crucible and cupel, and the silver remaining in the weighed gold are determined by analysis. Corrections are then applied to the normal gravimetric result. The corrected gravimetric fire assay procedure has been demonstrated to be accurate in the analysis of both fine gold and concentrates used in the preparation of other reference materials. Agreement, within 95% levels of confidence, was obtained on these materials by the laboratory we used and which specializes in corrected gravimetric fire assay analysis.

Six sub-samples of the concentrate used to make the candidate reference material OxA26 were analysed by corrected gravimetric fire assay. An average of the six results was used to assign a value for the gold concentration of this concentrate.

Calculation of Certified Value:

The gold concentration in this reference material was calculated by applying the dilution factor to the gold concentration of the concentrate. An allowance was made for the gold content of the diluent feldspar matrix, which contained 0.3 ppb gold, as determined by multiple analyses by a laboratory that specializes in the analysis for low-level gold. Calculations for uncertainties of measurement were carried out using the procedures described in the Eurochem book *Quantifying Uncertainty in Analytical Measurement*. Uncertainty contributions were calculated for the variability and accuracy of the single primary method

used, the potential for weight variation due to temperature and humidity changes in both the concentrate and feldspar diluent and in the calculation of the dilution factor.

The recommended value is provided at the beginning of the certificate in $\mu\text{g/g}$ (ppm) units. The accompanying uncertainty is an expanded uncertainty as defined in the *International Vocabulary of Basic and General Terms in Metrology*, 2nd ed., ISO1993, calculated using a coverage factor of 4.3, which gives a level of confidence of approximately 95%.

Legal Notice:

This certificate and the reference material described in it have been prepared with due care and attention. However ROCKLABS Ltd, Malcolm Smith Reference Materials Ltd and Tim Ball Ltd accept no liability for any decisions or actions taken following the use of the reference material.

References:

For further information on the preparation and validation of this reference material please contact Malcolm Smith.

Certifying Officer

M G Smith BSc, FNZIC

Independent Statistician

A handwritten signature in black ink that reads "Tim Ball". The signature is written in a cursive, flowing style.

Tim Ball BSc (Hons)