



# Certificate of Analysis 1031

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Version: 03

## CRM ITAK-1005

### Certified Reference Material – Bauxite

Table 1 – ITAK-1005 – Certified Values

Element/Unit	Certified Value <sup>[1]</sup>	s <sup>[2]</sup>	s <sub>r</sub> <sup>[3]</sup>	s <sub>L</sub> <sup>[4]</sup>	U <sup>[5]</sup>
Available Al <sub>2</sub> O <sub>3</sub> (%) <sup>b, d</sup>	45.71	0.54	0.28	0.47	± 0.14
Reactive SiO <sub>2</sub> (%) <sup>b, c, j, k</sup>	1.54	0.15	0.074	0.13	± 0.040
Al <sub>2</sub> O <sub>3</sub> (%) <sup>a, e</sup>	50.95	0.52	0.16	0.50	± 0.13
SiO <sub>2</sub> (%) <sup>a, h, i</sup>	3.15	0.12	0.055	0.10	± 0.028
Fe <sub>2</sub> O <sub>3</sub> (%) <sup>a, e, h</sup>	13.35	0.20	0.083	0.18	± 0.046
TiO <sub>2</sub> (%) <sup>a, h</sup>	2.764	0.043	0.018	0.039	± 0.011
P <sub>2</sub> O <sub>5</sub> (%) <sup>a</sup>	0.3507	0.0077	0.0041	0.0066	± 0.0022
MnO (%) <sup>a</sup>	0.0996	0.0024	0.0017	0.0017	± 0.00063
CaO (%) <sup>a, l</sup>	0.0423	0.0037	0.0027	0.0026	± 0.0010
ZrO <sub>2</sub> (%) <sup>a, l</sup>	0.228	0.020	0.0047	0.019	± 0.0068
V <sub>2</sub> O <sub>5</sub> (%) <sup>a, l</sup>	0.0495	0.0036	0.00081	0.0035	± 0.0013
<sup>[6]</sup> LOI (%) <sup>f, g</sup>	28.59	0.30	0.12	0.27	± 0.072

<sup>[1]</sup> The Certified Value was calculated according to ISO Guide 35 and ISO 5725-2.

<sup>[2]</sup> The standard deviation for proficiency assessment was calculated according to ISO 13528 and 5725-2. This standard deviation can be used for control charts for individual analysis ( $n=1$ ).

<sup>[3]</sup> The within-laboratory standard deviation was calculated according to ISO 5725-2.

<sup>[4]</sup> The between-laboratory standard deviation was calculated according to ISO 5725-2.

<sup>[5]</sup> The combined standard uncertainty of the certified value was calculated according to ISO Guide 35.

<sup>[6]</sup> Loss On Ignition.

**Note:** The letters in front of the elements are codes for Analytical Methods used.

## **DESCRIPTION**

ITAK-1005 was prepared from a sample of Bauxite donated by a Bauxite Mining Company from the Southeast of Brazil in 2011.

This Certified Reference Material (CRM) is presented as a fine powder.

## **INTENDED USE AND INSTRUCTIONS**

ITAK-1005 provides an important control in analytical data from exploration and can be used as a tool for grade control in routine mining and laboratory operations.

This Certified Reference Material can be used for calibration of analytical equipment, assess and develop new methods, validation of analytical methods, and arbitration – proficiency testing for example.

The bottles/sachets content should be thoroughly mixed before taking samples of ITAK-1005.

The Certified Reference Material should be used without pre-treatment. ITAK is not responsible for any changes occurring after opening said bottles/sachets.

The Certified Reference Material should be stored in a dry place and without contact with excessive heat or moisture.

The minimum test portion of the Certified Reference Material is 0.5 g.

The Certified Reference Material should be dry before using. To dry samples, heat in an oven at  $105 \pm 5^\circ\text{C}$  for at least 1 h.

## **CHARACTERIZATION AND STATISTICAL EVALUATION OF ANALYTICAL DATA**

ITAK-1005 was analyzed by twenty specialized laboratories. The statistical evaluation was carried out according to ISO GUIDE 35 and ISO 5725-2, using: identification and treatment of outliers, stragglers and technically invalid data, certified value calculation, standard deviation calculation, and extended standard uncertainty calculation.

The Technical Report: RT-008/2020 STD contains full details of all phases of manufacturing, characterization results, participating laboratories, and the statistical evaluation.

Note: This report is available on the ITAK database for CRM users.

The certified values are metrologically traceable to the International System of Units (SI) derived unit for mass fraction (expressed as percent).

## **ANALYTICAL METHODS**

The methods used on the characterization of CRM ITAK-1005 are mentioned as follows:

- **a:** Fusion method and determination by X-Ray Fluorescence.
- **b:** Alkaline Digestion (Bayer Process) and determination by Atomic Emission Spectrometry – ICP-OES.
- **c:** Alkaline Digestion and determination by Atomic Absorption Spectrometry – AAS.
- **d:** Alkaline Digestion and determination by Titrimetric Method.
- **e:** Acid Digestion ( $\text{HNO}_3$  and  $\text{HCl}$ ) and determination by Titrimetric Method.
- **f:** Gravimetric Method.
- **g:** Thermogravimetric Method (TGA).
- **h:** Fusion method and determination by Atomic Emission Spectrometry – ICP-OES.
- **i:** Acid Digestion ( $\text{HNO}_3$  and  $\text{HCl}$ ) and determination by Gravimetric Method.
- **j:** Alkaline Digestion and determination by Gravimetric Method.
- **k:** Alkaline Digestion and determination by Colorimetric Method.
- **l:** Acid Digestion ( $\text{HNO}_3$  and  $\text{HCl}$ ) and determination by Atomic Emission Spectrometry – ICP-OES.

## **PERIOD OF VALIDITY**

This CRM characterization is valid until: **January 10, 2030.**

## **CERTIFICATE REPRODUCTION**

This certificate must not be modified and may only be reproduced in its entirety and without change.



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