



MATERIAL INFORMATION

BCR[®]-301

MULLITE

DESCRIPTION

Mullite is an orthogonal aluminium silicate with the following stoichiometric composition $3\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$. It is present in a variety of refractories rich in alumina. The sample consists of approximately 50 g of granular material with a particle size from 1 to 4 mm, in a small bottle.

MULLITE ($3\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$)		
COMPOSITION	Mass fraction ¹⁾ [g/kg]	Uncertainty ²⁾ [g/kg]
SiO ₂	278	5
Al ₂ O ₃	715	3
Fe ₂ O ₃	< 2	n.a.
CaO	< 1.2	n.a.
MgO	< 0.5	n.a.
Na ₂ O	< 1	n.a.
K ₂ O	< 0.5	n.a.
TiO ₂	< 0.5	n.a.
¹⁾ Unweighted mean of accepted mean values, independently obtained by 6 laboratories. The value is traceable to the International System of Units (SI). ²⁾ The uncertainty is the half-width of the 95% confidence interval of the mean defined in ¹⁾ .		
PLANES	d-Spacing ¹⁾ [nm]	Uncertainty ²⁾ [nm]
[110]	0.5382	0.0020
[210]	0.3390	0.0007
[220]	0.2695	0.0005
[121]	0.2206	0.0002
[331]	0.1524	0.0001
¹⁾ Unweighted mean of accepted mean values, independently obtained by 6 laboratories. The value is traceable to the method. ²⁾ The uncertainty is the half-width of the 95% confidence interval of the mean defined in ¹⁾ .		

RELATIVE REFLECTION INTENSITY		
PLANES	Indicative value	Indicative uncertainty
[110]	0.50	0.03
[210]	1	n.a.
[220]	0.40	0.03
[121]	0.59	0.03
[331]	0.36	0.03

1) Unweighted mean of accepted mean values, independently obtained by 6 laboratories. The value is traceable to the method.
2) The uncertainty is the half-width of the 95% confidence interval of the mean defined in ¹⁾.

INSTRUCTIONS FOR USE

The reference material must be ground under the same conditions as the material to be analysed. Care must be taken to avoid overgrinding responsible for a decrease of sharpness and intensity of the reflection lines.

When used for calibration purposes, this material can be considered as containing 0.97 g/g mullite.

The use of the reference material does not protect the user against errors that may arise when the sample being analysed is not as well crystallized as the standard.

PARTICIPATING LABORATORIES

- Arbed, Divison d'Esch-Belval, Esch-sur-Alzette (LU)
- British Ceramic Research Association, Stoke-on-Trent (GB)
- Forschungsinstitut der Feuerfest-Industrie, Bonn (DE)
- Institute for Industrial Research and Standards, Dublin (IE)
- European Commission, Joint Research Centre, Ispra (IT)
- Société Française de Céramique, Paris (FR)

STORAGE

Upon receipt the unopened containers should be stored at a maximum temperature of 20 °C.

The European Commission cannot be held responsible for changes that can take place during storage of the material at the customer's premises, especially of opened samples.

SAFETY INFORMATION

Standard safety precautions in an analytical laboratory apply.

DISCLAIMER

The information given should be regarded as guidance values only and not as binding ones. BCR[®]-301 is **not** a reference material, because it has not been tested for homogeneity and stability.

LEGAL NOTICE

Neither IRMM, its subsidiaries, its contractors nor any person acting on their behalf.

(a) make any warranty or representation, express or implied that the use of any information, material, apparatus, method or process disclosed in this document does not infringe any privately owned intellectual property rights; or

(b) assume any liability with respect to, or for damages resulting from, the use of any information, material, apparatus, method or process disclosed in this document save for loss or damage arising solely and directly from the negligence of IRMM or any of its subsidiaries.

NOTE

A technical report on the production of BCR[®]-301 is available on the internet (<http://www.irmm.jrc.be>). A paper copy can be obtained from IRMM on request.

Geel, Belgium, May 2007

Signed: _____



Prof. Dr. Hendrik Emons
Unit for Reference Materials
EC-JRC-IRMM
Retieseweg 111
2440 Geel, Belgium