FLX-0104-04-COA

Certificate of Analysis

FLX-CRM 104

New certificate issued January 2021

Reference Material Information

Type:	Zeolite (adsorption material)
Form and Size:	Granulate, as-produced, 35g
Manufactured by:	Chemiewerk Bad Köstritz CWK GmbH, Germany
Packaged and tested by:	FLUXANA GmbH & Co.KG, Germany
Certified by:	FLUXANA GmbH & Co.KG, Germany

Certified values and their uncertainties

Percentage element by weight

Constituent	Al2O3	CaO	Fe2O3	Na2O	SiO2	L.O.I
Value[1]	**33.74**	**0.063**	**0.014**	**20.06**	**45.98**	**(22.64)**
Uncertainty[2]	0.33	0.019	0.003	0.26	0.27	(0.69)

Notes: All values (except LOI) apply after ignition at 950°C for 1 hour.

Values in brackets are informal only.

LOI is informal only and is excluded from certification because it might change over time.

A concentration of 0,0135weight% K2O was determined by XRF analysis with pressed pellet sample preparation.

Definitions

1 The above values are the present best estimates of the true content for each component. Each value is a panel consensus, based on the averaged results of an inter laboratory testing program, detailed in values obtained by individual laboratories or methods.

2 The uncertainty values are coming from the half width confidence interval C(95%). It is equal to C(95%) = (t x s)/√n where t is the appropriate Student's value, n the number of acceptable mean values and s the standard deviation.

FLX-0104-04-COA

Certified by

FLUXANA GmbH & Co.KG, Dr. Rainer Schramm on 01th November 2010

Certificate reissued by

FLUXANA GmbH & Co.KG, Susan Aschenbrenner on 12th January 2021

Description of the CRM

This reference material is an industrial product and was taken directly from the production stream. The complete batch was sealed into 50 ml bottles. This material is normally used for the production of molecular sieves.

Intended use

Calibration and control sample for x-ray fluorescence (xrf) analysis.

Instructions for the correct use of the CRM

This material has to be ignited for minimum 1 hour at 950°C prior use. The ignition process must result in a constant weight. The ignited material must be stored in a desiccator not longer than 24h, then reignition might be necessary. The minimum sample quantity for analysis should be 0.5g. The material is moisture sensitive.

For XRF use, ignited samples should be prepared as a fused bead, using e.g. 1 part sample + 8 parts Lithium tetraborate, prepared on an automated fusion machine, and otherwise in accordance with EN ISO 12677:2009.

FLX-0104-04-COA

Hazardous situation

Not hazardous according 67/548/EWG and 1999/45/EG.

Level of homogeneity

The batch was checked for uniformity using a wavelength-dispersive XRF unit, and a test method in conformance with ISO 29581-2:2010.

Using the data from each sample, standard deviation values were derived for each element as an indicator of any non-homogeneity (as determined for the specific sample size taken by the spectrometer).

Traceability

The analytical work performed to assess this material has been carried out by competent, laboratories, from raw material industry. All of the results derived as part of this testing program have traceability to NIST and other national standards, as part of the analytical calibration or process control.

FLX-0104-04-COA

Values obtained by individual laboratories or methods

Lab No.	Al2O3	CaO	Fe2O3	K2O	Na2O	SiO2	L.O.I
1	34,28	0,12	0,01	0,05	20,04	45,59	22,74
2	34,23	0,01	0,01	0,03	20,47	46,57	22,84
3	33,12	0,06	0,03	0,08	20,59	45,68	23,14
4	33,81	0,02	0,02	0,13	19,83	46,26	23,76
5	33,38	0,07	0,02		19,82	45,75	22,50
7	33,92	0,07	0,02	0,12	19,61	46,15	21,58
8	33,42	0,05	0,01	0,02	20,26	46,00	*19,37*[1]
9	33,45	0,04	0,03	0,17	20,18	46,01	22,74
10	33,07	0,02		0,12	*21,14*[1]	45,36	23,71
11		0,07	0,01	0,05	19,45		
11	*35,55*[1]	*0,14*[1]	0,02	0,06		*44,70*[1]	
12	33,98	0,08	0,02	0,04	19,15	46,66	22,82
13	32,90	0,05	0,01	0,06	20,31	46,48	23,58
14	33,79	0,05	0,01	0,01	20,01	46,14	
14	33,63		0,01	0,02	19,90	46,34	
15	33,63	0,09		0,06	20,43	45,74	22,53
16	33,73	0,08	0,01	*0,20*[1]	19,85	46,26	23,00
Mean	**33,74**	**0,06**	**0,01**	**0,08**	**20,06**	**45,98**	**22,64**
Stddev	0,62	0,03	0,01	0,06	0,48	0,5	1,14
C (95%)	0.33	0.019	0.003	0.030	0.26	0.27	0.69

[1]These results show a z-score > 2 however were not excluded.

FLX-0104-04-COA

Methods used

The method most used is x-ray fluorescence analysis with fused bead as sample preparation (EN ISO 12677:2009). This was performed by laboratory 2,3,4,5,6,7,8,9,10,12,13,14,15,16.
Laboratory 1,11 and 14 used ICP method with digestion.
Laboratory 11 used x-ray fluorescence analysis with pressed powder preparation.
Loss on ignition (L.O.I) was determined by gravimetry 1h at 950°C (EN 196-2).

Participating Laboratories

Bachema AG	Switzerland
CeramTec AG	Germany
CRB Analyse Service GmbH	Germany
ESAB	Sweden
FGK Forschungsinstitut fuer Anorganische Werkstoffe-Glas/Keramik- GmbH	Germany
FH Nürnberg FB Werkstofftechnik	Germany
FLUXANA GmbH & Co.KG	Germany
GEKA mbH	Germany
Grothe Rohstoffe GmbH & Co KG	Germany
Holcim (Schweiz) AG	Switzerland
HuK Umweltlabor GmbH	Germany
LERM	France
LSI - Laboratory Services International	Netherlands
terrachem GmbH	Germany
VDZ	Germany
WESSLING Laboratorien GmbH Umweltanalytik	Germany

Further information

This Reference Material has been produced and certified, wherever possible, in accordance with the requirements of ISO Guide 34-2009, ISO Guide 31-2000 and ISO Guide 35-2006, taking into account the requirements of the ISO Guide to the Expression of Uncertainty in Measurement (GUM).

This certification is applicable to the whole of the sample.

As-supplied, this material will not remain stable indefinitely. The matrix will be affected by contact with the atmosphere, and in particular it will absorb moisture. However, it continues to be fit for use for an indeterminate period, on the understanding that the sample will be ignited prior to weighing, bead preparation and measurement.

All production records will be retained for a period of 10 years from the date of this certificate. This certification will therefore expire in 11.11.2030, although we reserve the right to make changes as issue revisions, in the intervening period.

The certification, packaging, analysis and storage of this product were supervised by Dr. Rainer Schramm, General Manager, FLUXANA GmbH & Co. KG, Bedburg-Hau, Germany.