WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

BiMEP

International Biomass Exchange Program

REFERENCE MATERIAL

BIMEP sample 482

WAGENINGEN
UNIVERSITY & RESEARCH

BIMEP

Certificate of Analysis   BIMEP 482

General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model mean and standard deviation are calculated using all reported data when at least 8 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into three sections: Consensus Values, Indicative Values and Values for Information. The division is made on the reliability of the data. Consensus Values are based on at least 16 results while the coefficient of variation is smaller than 25 %. Indicative Values are based on at least 8 and less than 16 results or a coefficient of variation between 25 % and 50 %. Other values, based on more than 2 and less than 8 results or a coefficient of variation higher than 50 %, are given for information only.

In the sections with Consensus Values and Indicative Values the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median and MAD (Median of Absolute Deviation) and the uncertainty in the consensus values. The confidence limits (at 95 % probability) are calculated for these determinands.
In the section with Information Values the following parameters are given: median, MAD and number of results. For determinands which have at least 5 results reported as smaller than (<) the median of these 'smaller than results' is calculated. In some cases this median of '<' values is much smaller than median and mean of the indicative values. This may be caused by a too optimistic (too low) value for the detection limit reported by a (small) majority of participating laboratories who report '<'-values.

All values, expressed on a weight basis (kg or %), are reported in oven dry (105 °C) material. Moisture is reported in the material as received.

Sample information

WEPAL reference materials are from natural sources only. There is no spiking, mixing or other alterations of the samples. For sample preparation the BIMEP samples are dried at 40 °C and milled to pass a 0.5 mm sieve.

This BIMEP sample 482 of Yam / Dioscorea from Netherlands is prepared for the WEPAL proficiency programs. The sample is used in 2 periods (or rounds).   The results on which the values in this report are based were taken from the periods given in the following table.

Year	Round	Number
2022	4	4
2020	4	4

Consensus Values   BIMEP 482

Method: General Analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Ash	% (m/m)	9.50	0.164	1.7	19	9.50	0.100	0.047	9.42	-	9.58
Moisture	% (m/m)	7.49	0.387	5.2	20	7.52	0.256	0.108	7.31	-	7.67
Calorific Value (gross)	MJ/kg	17.8	0.36	2.0	18	17.8	0.25	0.11	17.57	-	17.93

Method: Elementary Analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Carbon (C)	% (m/m)	45.3	1.49	3.3	16	45.0	1.04	0.46	44.5	-	46.1
Cl	g/kg	2.03	0.345	17.0	16	1.95	0.247	0.108	1.85	-	2.21
S	g/kg	1.64	0.295	18.0	17	1.60	0.200	0.089	1.49	-	1.79

Indicative Values   BIMEP 482

Method: General Analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Volatile Matter	% (m/m)	74.6	0.27	0.4	15	74.6	0.20	0.09	74.48	-	74.78

Method: Elementary Analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Hydrogen (H)	% (m/m)	5.78	0.195	3.4	15	5.72	0.140	0.063	5.67	-	5.89
Nitrogen (N)	% (m/m)	1.77	0.313	17.7	15	1.83	0.210	0.101	1.60	-	1.94
Oxygen (O)	% (m/m)	38.1	0.88	2.3	9	38.3	0.70	0.37	37.4	-	38.7

Method: Minor Elements

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Cd	mg/kg	0.981	0.3081	31.4	8	0.956	0.2240	0.1361	0.730	-	1.23
Mn	mg/kg	220	27.8	12.6	8	215	20.0	12.3	198	-	243
Zn	mg/kg	81.7	23.41	28.6	8	80.2	15.75	10.35	62.7	-	101

Method: Major Elements

Element	Unit	Median	MAD	N
Al	g/kg	0.0711	0.0236	5
Ca	g/kg	20.3	2.25	6
Fe	g/kg	0.123	0.0130	7
K	g/kg	14.9	3.69	7
Mg	g/kg	3.24	0.200	6
Na	g/kg	0.196	0.0964	6
P	g/kg	3.54	0.095	6
Si	g/kg	0.435	0.1195	4

Method: Minor Elements

Element	Unit	Median	MAD	N
As	mg/kg	0.282	0.0750	4
Ba	mg/kg	12.6	1.73	7
Co	mg/kg	0.0800	0.0130	3
Cr	mg/kg	1.31	0.110	7
Cu	mg/kg	6.17	0.985	6
F	mg/kg	12.0	2.00	5
Hg	mg/kg	0.0480	0.0280	3
Mo	mg/kg	2.07	0.240	4
Ni	mg/kg	1.12	0.420	7
Pb	mg/kg	2.24	0.605	6
Sb	mg/kg	0.269	0.1690	3
Sn	mg/kg	0.307	0.1900	4
Ti	mg/kg	1.79	0.270	5