Key comparison CCQM-K55.b

MEASURAND : Mass fraction of Aldrin in the CCQM-K55.b samples

x_i : result of measurement carried out by laboratory *i*

u_i : combined standard uncertainty of x_i

Lab *i*	x_i / (mg/g)	u_i / (mg/g)
BAM	953	4
BIPM	962.6	+0.65, -0.75
CENAM	960.7	3.5
GL	963.1	1.7
HSA	950.4	1.3
INMETRO	966.8	0.57
INTI	963.7	9.5
KRISS	961.6	0.9
LGC	960.9	1.9
LNE	962.0	0.47
NIM	964.6	1.2
NIMT	958.5	1.4
NIST	961	+0.8, -0.9
NMIA	962.1	2.4
NMIJ	950.1	3.2
NMISA	960.2	1.9
NRC	947.8	3.0
UME	961.7	1.0
VNIIM	972.6	0.9

Key comparison CCQM-K55.b

MEASURAND : Mass fraction of Related Structure Impurities in the CCQM-K55.b samples

x_i **:** result of measurement carried out by laboratory *i*

u_i **:** combined standard uncertainty of x_i

Lab *i*	x_i / (mg/g)	u_i / (mg/g)
BAM	36.2	0.05
BIPM	34.4	0.65
CENAM	38.9	2.6
GL	35.3	1.69
HSA	34.6	0.72
INMETRO	32.7	0.57
INTI	24.4	0.5
KRISS	35.5	0.11
LGC	36.45	1.83
LNE	33.94	0.46
NIM	32.5	1.1
NIMT	34.8	1.38
NIST	36.1	0.8
NMIA	34.8	0.32
NMIJ	37	0.5
NMISA	36.9	0.93
UME	32.85	0.047
VNIIM	27.3	0.9

Key comparison CCQM-K55.b

MEASURAND : Mass fraction of Water in the CCQM-K55.b samples

x_i : result of measurement carried out by laboratory *i*

u_i : combined standard uncertainty of x_i

Lab *i*	x_i / (mg/g)	u_i / (mg/g)
BAM	0.42	0.045
BIPM	0.5	0, -0.29
CENAM	0.4	0.05
GL	0.46	0.03
HSA	0.40	0.14
INMETRO	0.54	0.013
INTI	11.9	0.1
KRISS	0.32	0.07
LGC	0.47	0.49
LNE	1.31	0.035
NIM	1.24	0.18
NIMT	6.43	0.2
NIST	0.44	0.045, -0.085
NMIA	0.91	1.8
NMIJ	0.31	0.02
NMISA	0.6	0.11
UME	2	0.06
VNIIM	0.11	0.01

Key comparison CCQM-K55.b

MEASURAND : Mass fraction of Volatile Organic Content in the CCQM-K55.b samples

x_i **:** result of measurement carried out by laboratory *i*

u_i **:** combined standard uncertainty of x_i

Lab *i*	x_i / (mg/g)	u_i / (mg/g)
BAM	2.0	0.05
BIPM	2.5	0.04
GL	0.9	0.07
HSA	5.2	0.25
KRISS	2.44	0.06
LGC	2.14	0.46
LNE	2.74	0.09
NIM	1.67	0.15
NIST	2.33	0.14
NMIA	2.32	0.6
NMIJ	3.49	0.04
NMISA	2.33	0.0002
UME	3.0	0.06

Key comparison CCQM-K55.b

MEASURAND : Mass fraction of Non-Volatile Content in the CCQM-K55.b samples

x_i **:** result of measurement carried out by laboratory *i*

u_i **:** combined standard uncertainty of x_i

Lab *i*	x_i / (mg/g)	u_i / (mg/g)
BIPM	0	+0.03, 0
GL	0.25	+0.14, -0.12
HSA	9.9	1.05
INMETRO	0.00008	0.000007
KRISS	0	+0.9, 0
LGC	0.15	0.04
NIM	0.038	0.02
NIMT	0	0.14
NIST	0.05	0.01
NMIA	0	1.2
NMIJ	12.12	1.0
NMISA	0	0.11
UME	0.5	0.0033
VNIIM	0	-

Key comparison CCQM-K55.b

MEASURAND : Mass Fraction of Aldrin in the CCQM-K55.b samples

The key comparison reference value for the mass fraction of aldrin x_R, was calculated by subtraction from the limit value of 1000 mg/g of the summation of the individual estimates for each contributing class of impurities present in CCQM-K55.b samples, as explained in page 24 of the Final Report. Its standard uncertainty, u_R, is computed by combination in quadrature of the uncertainties associated with each contributing impurity estimate and also uncertainties in the inter-unit homogeneity of related structure impurity and volatile organic solvent content.
x_R = 950.8 mg/g, u_R = 0.85 mg/g

MEASURAND : Mass fraction of individual impurity classes in the CCQM-K55.b samples

Key comparison reference values (x_R) and associated standard uncertainty (u_R) were assigned for the mass fraction of each orthogonal impurity class - related structures, water, volatile organics and non-volatiles - quantified by the participants in CCQM-K55.b who used a mass balance approach to assign the aldrin content. They are consensus values derived from the individual data supplied by each participant. The assignment method varied by impurity class and each is separately described on pages 15 to 23 of the Final Report.
For Total Related Structure Impurities: x_R = 35.4 mg/g, u_R = 0.42 mg/g
For Water: x_R = 0.47 mg/g, u_R = 0.05 mg/g
For Volatile Organics x_R = 2.30 mg/g, u_R = 0.16 mg/g
For Non-Volatiles x_R = 11 mg/g, u_R = 0.58 mg/g

The degree of equivalence of laboratory *i* with respect to each key comparison reference value is given by a pair of terms, both expressed in mg/g:
$D_i = (x_i - x_R)$ and its expanded uncertainty ($k = 2$), $U_i = 2(u_R^2 + u_i^2)^{1/2}$

No pair-wise degrees of equivalence have been computed for this key comparison.

Key comparison CCQM-K55.b

Degrees of equivalence for Mass fraction of Aldrin

Lab *i* ⇩	D_i / (mg/g)	U_i / (mg/g)
BAM	**2.2**	8.2
BIPM	**11.8**	+2.1, -2.3
CENAM	**9.9**	7.2
GL	**12.3**	3.8
HSA	**-0.4**	3.1
INMETRO	**16.0**	2.0
INTI	**12.9**	19.1
KRISS	**10.8**	2.5
LGC	**10.1**	4.2
LNE	**11.2**	1.9
NIM	**13.8**	2.94
NIMT	**7.7**	3.3
NIST	**10.2**	+2.3, -2.5
NMIA	**11.3**	5.1
NMIJ	**-0.7**	6.6
NMISA	**9.4**	4.2
NRC	**-3.0**	6.2
UME	**10.9**	2.6
VNIIM	**21.8**	2.5

Key comparison CCQM-K55.b

Degrees of equivalence for Related Structure Impurities

Lab *i* ⇩	D_i / (mg/g)	U_i / (mg/g)
BAM	**0.80**	0.85
BIPM	**-1.00**	1.55
CENAM	**3.50**	5.27
GL	**-0.10**	3.48
HSA	**-0.80**	1.67
INMETRO	**-2.70**	1.42
INTI	**-11.00**	1.31
KRISS	**0.10**	0.87
LGC	**1.05**	3.76
LNE	**-1.46**	1.25
NIM	**-2.90**	2.35
NIMT	**-0.60**	2.88
NIST	**0.70**	1.81
NMIA	**-0.60**	1.06
NMIJ	**1.60**	1.31
NMISA	**1.50**	2.04
UME	**-2.55**	0.85
VNIIM	**-8.10**	1.99

Degrees of equivalence for Water

Lab *i* ⇩	D_i / (mg/g)	U_i / (mg/g)
BAM	**-0.05**	0.14
BIPM	**0.03**	+0.10, -0.59
CENAM	**-0.07**	0.14
GL	**-0.01**	0.14
HSA	**-0.07**	0.30
INMETRO	**0.07**	0.10
INTI	**11.43**	0.22
KRISS	**-0.15**	0.17
LGC	**0.00**	0.99
LNE	**0.84**	0.12
NIM	**0.77**	0.37
NIMT	**5.96**	0.41
NIST	**-0.03**	+0.13, -0.20
NMIA	**0.44**	3.60
NMIJ	**-0.16**	0.11
NMISA	**0.13**	0.24
UME	**1.53**	0.16
VNIIM	**-0.36**	0.10

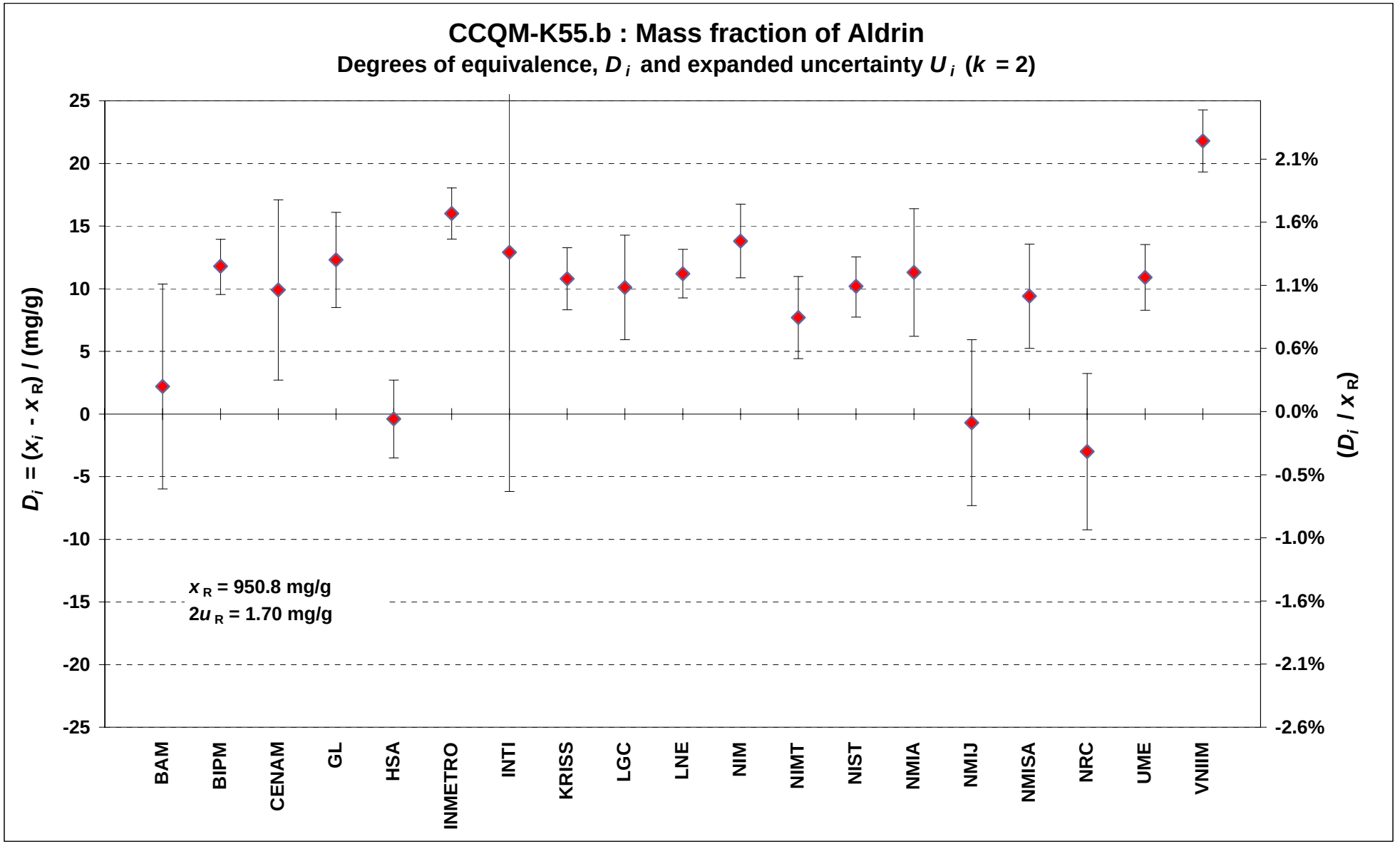
Key comparison CCQM-K55.b

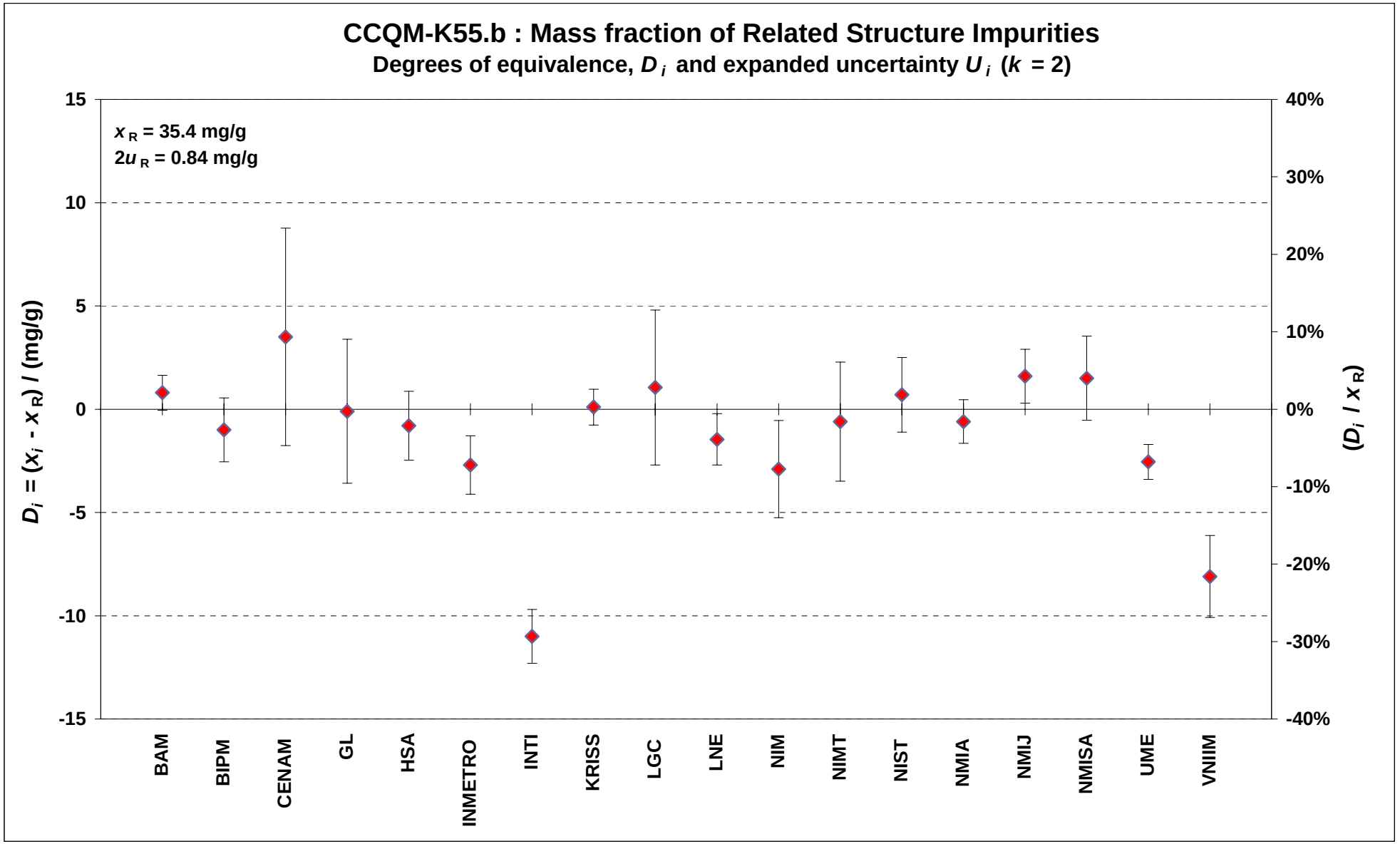
Degrees of equivalence for Volatile Organics

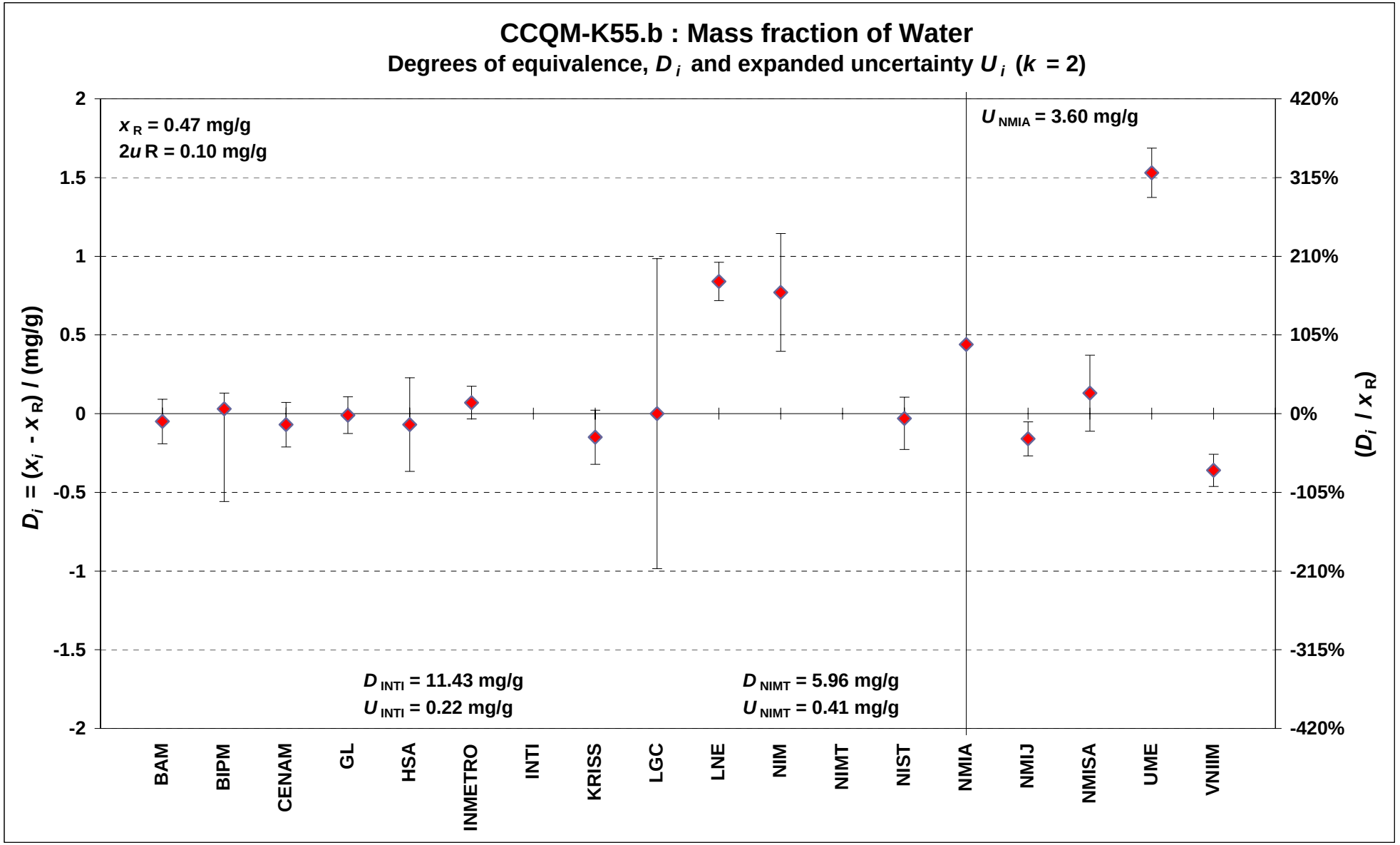
Lab *i* ⇩	D_i / (mg/g)	U_i / (mg/g)
BAM	**-0.30**	+0.34, -0.12
BIPM	**0.20**	0.33
GL	**-1.40**	0.36
HSA	**2.90**	0.59
KRISS	**0.14**	0.34
LGC	**-0.16**	0.97
LNE	**0.44**	0.37
NIST	**0.03**	0.43
NIM	**-0.63**	0.44
NMIA	**0.02**	1.24
NMISA	**0.03**	0.32
NMIJ	**1.19**	0.33
UME	**0.70**	0.34

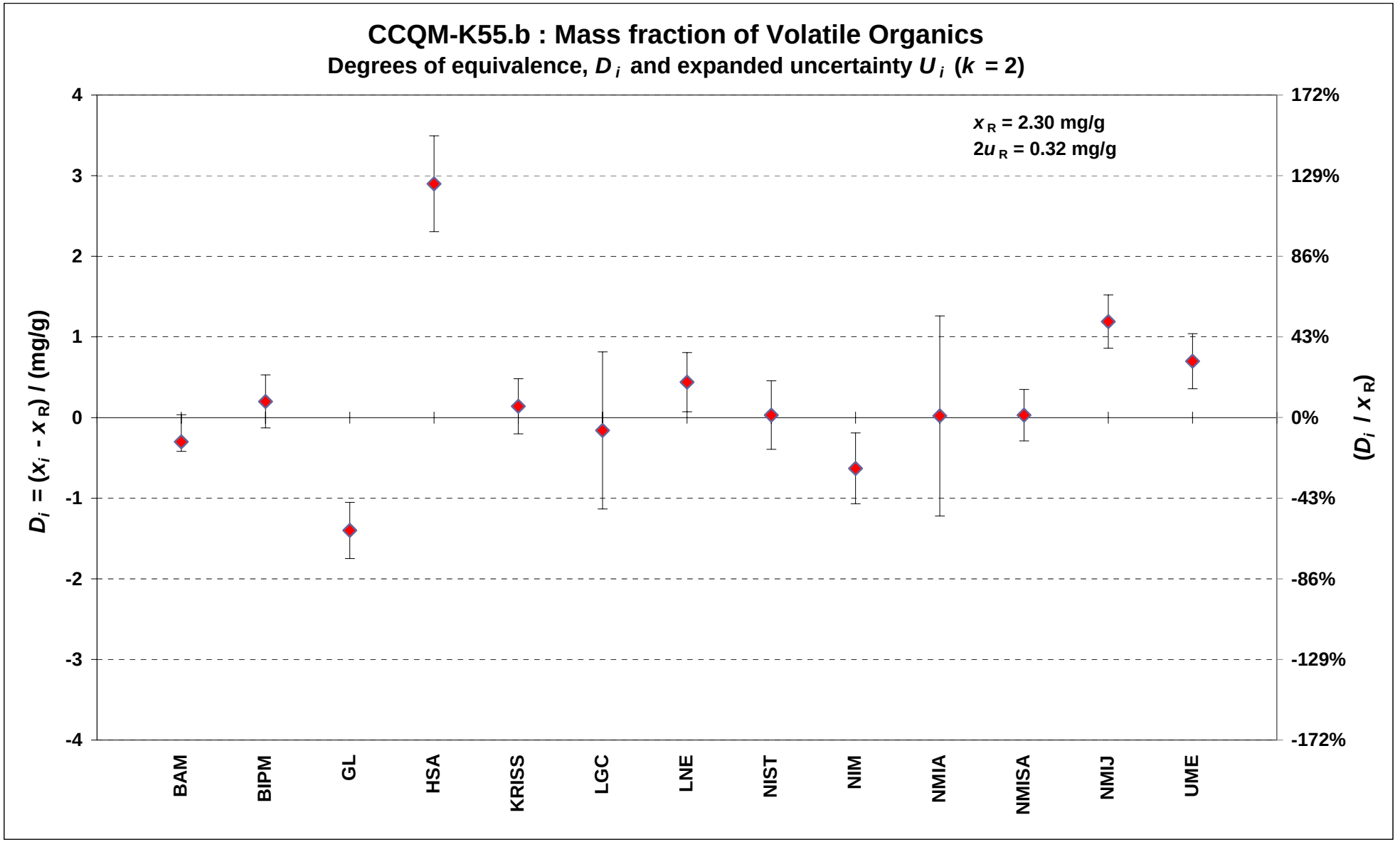
Degrees of equivalence for Non-Volatiles

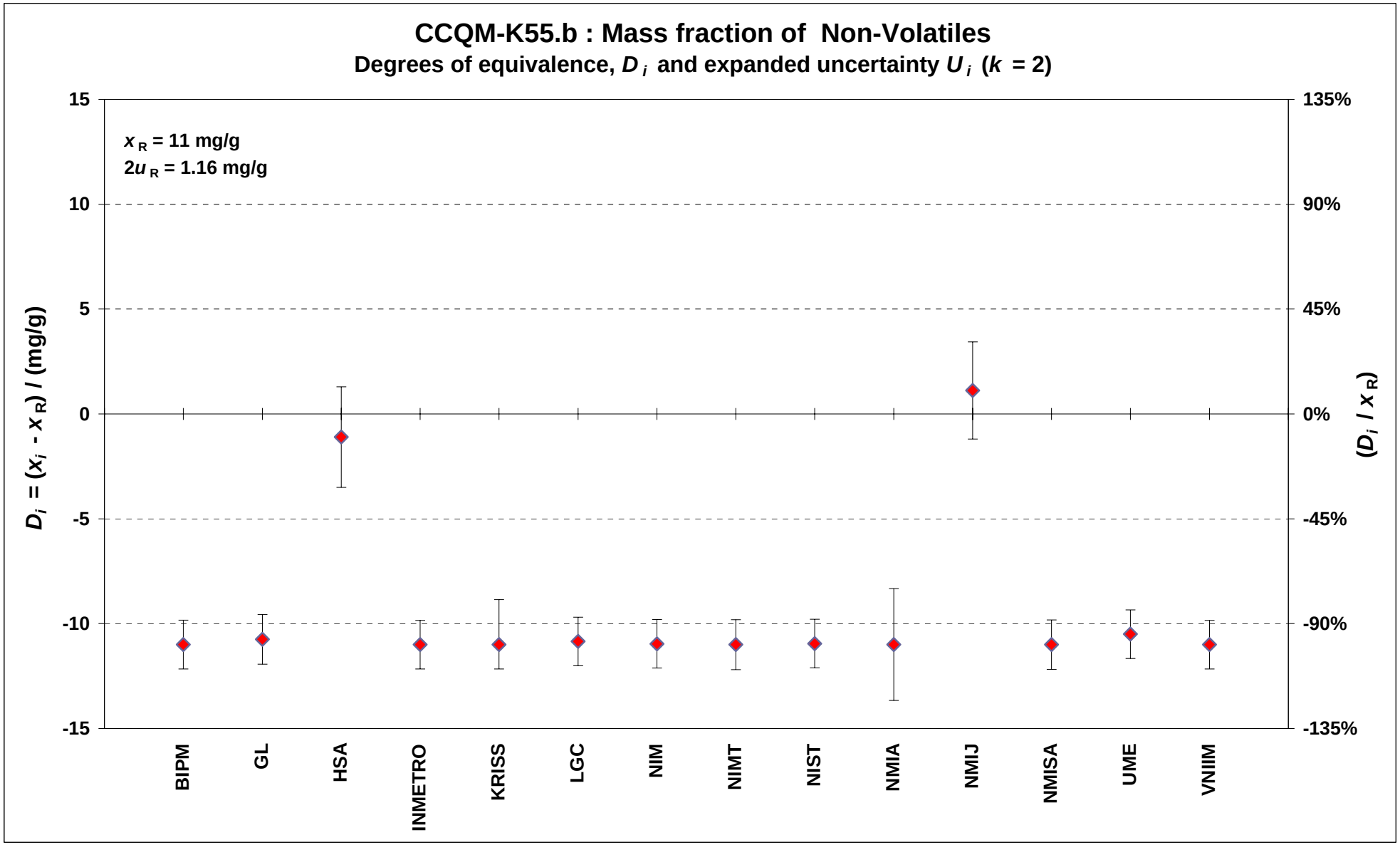
Lab *i* ⇩	D_i / (mg/g)	U_i / (mg/g)
BIPM	**-11.00**	1.16
GL	**-10.75**	+1.19, -1.18
HSA	**-1.10**	2.40
INMETRO	**-11.00**	1.16
KRISS	**-11.00**	+2.14, -1.16
LGC	**-10.85**	1.16
NIM	**-10.96**	1.16
NIMT	**-11.00**	1.19
NIST	**-10.95**	1.16
NMIA	**-11.00**	2.67
NMIJ	**1.12**	2.31
NMISA	**-11.00**	1.18
UME	**-10.50**	1.16
VNIIM	**-11.00**	1.16


CCQM-K55.b : Mass fraction of Aldrin
Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2)
$D_i = (x_i - x_R)$ / (mg/g)
(D_i / x_R)
x_R = 950.8 mg/g
$2u_R$ = 1.70 mg/g
25
20
15
10
5
0
-5
-10
-15
-20
-25
2.1%
1.6%
1.1%
0.6%
0.0%
-0.5%
-1.0%
-1.6%
-2.1%
-2.6%
BAM
BIPM
CENAM
GL
HSA
INMETRO
INTI
KRISS
LGC
LNE
NIM
NIMT
NIST
NMIA
NMIJ
NMISA
NRC
UME
VNIIM


CCQM-K55.b : Mass fraction of Related Structure Impurities
Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2)
x_R = 35.4 mg/g
$2u_R$ = 0.84 mg/g
$D_i = (x_i - x_R)$ / (mg/g)
(D_i / x_R)
15
10
5
0
-5
-10
-15
40%
30%
20%
10%
0%
-10%
-20%
-30%
-40%
BAM
BIPM
CENAM
GL
HSA
INMETRO
INTI
KRISS
LGC
LNE
NIM
NIMT
NIST
NMIA
NMIJ
NMISA
UME
VNIIM


CCQM-K55.b : Mass fraction of Water
Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2)
x_R = 0.47 mg/g
2u R = 0.10 mg/g
U_{NMIA} = 3.60 mg/g
D_{INTI} = 11.43 mg/g
U_{INTI} = 0.22 mg/g
D_{NIMT} = 5.96 mg/g
U_{NIMT} = 0.41 mg/g
$D_i = (x_i - x_R)$ / (mg/g)
(D_i / x_R)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
420%
315%
210%
105%
0%
-105%
-210%
-315%
-420%
BAM
BIPM
CENAM
GL
HSA
INMETRO
INTI
KRISS
LGC
LNE
NIM
NIMT
NIST
NMIA
NMIJ
NMISA
UME
VNIIM


CCQM-K55.b : Mass fraction of Volatile Organics
Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2)
x_R = 2.30 mg/g
$2u_R$ = 0.32 mg/g
$D_i = (x_i - x_R)$ / (mg/g)
(D_i / x_R)
4
3
2
1
0
-1
-2
-3
-4
172%
129%
86%
43%
0%
-43%
-86%
-129%
-172%
BAM
BIPM
GL
HSA
KRISS
LGC
LNE
NIST
NIM
NMIA
NMISA
NMIJ
UME


CCQM-K55.b : Mass fraction of Non-Volatiles
Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2)
x_R = 11 mg/g
$2u_R$ = 1.16 mg/g
$D_i = (x_i - x_R)$ / (mg/g)
(D_i / x_R)
15
10
5
0
-5
-10
-15
135%
90%
45%
0%
-45%
-90%
-135%
BIPM
GL
HSA
INMETRO
KRISS
LGC
NIM
NIMT
NIST
NMIA
NMIJ
NMISA
UME
VNIIM