

Úlety, popílky, aerosoly

1.1.

	SOL X1501	SOL X6203	SOL X6204	SOL X6205	SOL X5705	SOL X5706	SOL X5707	SOL X5708
	Iron Ore Sinter Dust	Electric Arc Furnace Dust	Cupola Dust	Cupola Dust		Rice Straw Ashes-Termostil		
	100g	100 g	100g	100g	100g	100g	100g	100g
	%	%	%	%	%	%	%	%
CaO	7,11	1,23	2,54	4,91	2,51	1,04	1,78	0,97
SiO ₂	6,13	15,65	26,94	34,52	76,31	87,92	82,15	86,67
Fe	52,32	-	-	-	-	-	-	-
FeO	3,24	-	-	-	-	-	-	-
Fe ₂ O ₃	71,2	36,85	8,99	9,49	2,89	0,125	1,50	0,931
MnO	-	-	-	-	0,245	0,271	0,259	0,117
Mn ₃ O ₄	0,327	4,97	1,35	2,57	-	-	-	-
P ₂ O ₅	0,104	0,52	0,051	0,147	0,123	0,755	0,443	0,226
S	-	-	-	-	-	-	-	-
SO ₃	0,83	5,29	2,72	2,7	0,409	0,593	0,524	0,255
CuO	-	0,31	0,098	0,163	-	-	-	-
Al ₂ O ₃	1,23	2,57	1,06	1,3	0,363	0,073	0,223	1,15
MgO	1,49	3,1	1,53	1,85	9,60	0,526	5,09	3,10
NiO	-	0,053	0,023	0,005	-	-	-	-
Cr ₂ O ₃	-	0,004	0,072	0,041	-	-	-	-
SnO ₂	-	0,005	0,051	0,018	-	-	-	-
V ₂ O ₅	-	0,004	0,051	0,019	-	-	-	-
MoO ₃	-	0,012	0,075	0,030	-	-	-	-
TiO ₂	0,107	0,52	0,18	0,060	0,217	0,231	0,223	0,126
PbO	0,103	1,05	3,48	2,43	-	-	-	-
ZnO	0,012	12,32	30,65	21,01	-	-	-	-
BaO	-	-	-	-	-	-	-	-
Co ₃ O ₄	-	-	-	-	-	-	-	-
CdO	0,001	<0,0002	0,023	0,006	-	-	-	-
Cl	1,11	2,00	3,62	2,88	-	-	-	-
F	0,377	0,57	0,247	0,096	-	-	-	-
Na ₂ O	0,121	5,12	2,63	2,26	0,116	0,124	0,117	0,085
K ₂ O	1,59	2,52	4,96	3,68	0,653	3,10	1,89	0,872
C	2,78	4,22	8,08	6,80	4,33	3,62	4,03	3,83
Co ₂	2,59	1,00	2,02	3,84	0,265	0,056	0,158	0,094
ZrO ₂	-	-	-	-	-	-	-	-
H ₂ O(600)	1,04	-	-	-	-	-	-	-
H ₂ O(900)	-	0,214	0,055	0,107	2,32	1,38	1,82	1,70
Th	2,2 µg/g	-	-	-	-	-	-	-
U	1,4 mg/g	-	-	-	-	-	-	-
Grain size	<0,1mm	<0,1mm	<0,1mm	<0,1mm	<0,125mm	<0,125mm	<0,125mm	<0,125mm

	CTA FFA-1	URE ENO	URE EOP	URE ECH	URE KHK	NIST 1633b	NIST 2689	NIST 2690	NIST 2691	NIST 1648a
	Fine Fly Ash	Fly Ash - Coal	Fly Ash - Coal	Fly Ash - Coal	Copper- mill Ash	Fly Ash - Coal	Fly Ash - Coal	Fly Ash - Coal	Fly Ash - Coal	Urban par. Matter
	50g	50 g	50 g	50 g	50 g	75 g	3x10 g	3x10 g	3x10 g	2 g
	mg/kg	μg/g	μg/g	μg/g	μg/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Ag	-	(<2)	(7,8)	(13)	(190)	-	-	-	-	-
Al	14,87%	10,90%	15,8%	14,60%	(0,620%)	15,05%	12,94%	12,35%	9,81%	3,42%
As	53,6	(0,179%)	79,1	56,9	(2,88%)	136,2	(200)	(26)	(30)	115
Au	-	(<0,02)	(<0,03)	(0,01)	(1,4)	-	-	-	-	-
B	-	(280)	(150)	(200)	-	-	-	-	-	-
Ba	835	674	0,110%	711	(0,160%)	709	(800)	(5800)	(5900)	(737)
Be	(27)	(6,1)	(23,3)	(10,1)	(<0,04)	-	(21)	(8)	(8)	-
Bi	-	(<4)	(<4)	(<4)	(0,31%)	-	-	-	-	-
Br	-	(2)	(2)	(4)	-	(2,9)	-	-	-	(500)
Ca	(2,29%)	3,34%	(1,68%)	(1,86%)	(2,23%)	1,51%	2,18%	5,71%	18,45%	-
Cd	(2,8)	(2)	(2,94)	(3,06)	(442)	0,784	(3)	(0,7)	(0,9)	75
Ce	120	(98,7)	322	183	(10)	(190)	-	-	-	(55)
Cl	0,068	(150)	(51)	(110)	(0,11%)	-	-	-	-	(0,45%)
Co	-	(26,1)	53,2	49,8	(313)	(50)	(48)	(19)	(26)	(18)
Cr	156	96,1	183	183	(157)	198,2	(170)	(67)	(68)	403
Cs	48,2	118	20,1	(23,0)	(230)	(11)	(11)	(8)	(1)	(3)
Cu	158	61	229	157	(19,5%)	112,8	-	-	-	609
Dy	9,09	(7)	(11)	(9)	-	(17)	-	-	-	-
F	198	(9)	(2)	(8)	-	-	-	-	-	-
Eu	2,39	1,76	4,99	(2,95)	-	(4,1)	(3)	(2)	(2)	-
Er	4,52	-	-	-	-	-	-	-	-	-
Fe	4,89%	7,46%	5,16%	5,57%	(23,1%)	7,78%	9,32%	3,57%	4,42%	3,91%
Ga	(49)	(29)	(67,0)	(73,8)	-	-	-	-	-	-
Gd	10,0	(9)	(21)	(12)	-	(13)	-	-	-	-
Ge	-	(17)	(11)	(9)	-	-	-	-	-	-
Hf	6,09	(4,89)	(17,7)	(8,22)	-	(6,8)	(7)	(8)	(10)	(4,4)
Hg	-	(0,008)	(0,016)	(0,012)	(52,4)	0,141	(<0,003)	(<0,003)	(<0,003)	-
Ho	-	-	-	-	-	(3,5)	-	-	-	-
I	-	-	-	-	-	-	-	-	-	(20)
In	(0,34)	(0,11)	(0,2)	(0,2)	(82)	-	-	-	-	(1,0)
K	(2,20%)	1,73%	0,64%	1,32%	(0,346%)	1,95%	2,20%	1,04%	0,34%	1,05%
La	60,7	(42,9)	164	84,4	-	(94)	-	-	-	(42)
Li	128	(79)	(190)	(130)	(1,8)	-	-	-	-	-
Lu	0,658	(0,54)	(0,51)	(0,61)	-	(1,2)	-	-	-	-
Mg	(1,55%)	1,20%	(0,58%)	0,79%	(0,456%)	0,482%	0,61%	1,53%	3,12%	(0,8%)
Mn	1066	634	440	381	(578)	131,8	(300)	(300)	(200)	786
Mo	(17)	(18)	(14)	(7,6)	(246)	-	-	-	-	-

pokračování

pokračování

	CTA FFA-1	URE ENO	URE EOP	URE ECH	URE KHK	NIST 1633b	NIST 2689	NIST 2690	NIST 2691	NIST 1648a
	mg/kg	µg/g	µg/g	µg/g	µg/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Na	2,19%	0,54%	(0,37%)	(0,29%)	(0,101%)	0,201%	0,25%	0,24%	1,09%	0,425%
Nb	56,8	(25)	(190)	(98)	-	-	-	-	-	-
Nd	56,8	(56)	(140)	(86)	-	(85)	-	-	-	-
Ni	99,0	(77)	(108)	(117)	(188)	120,6	(122)	(46)	(53)	82
P	725	(650)	(0,130%)	(830)	-	(2300)	0,10%	0,52%	0,51%	-
Pb	369	41,7	40,7	70,7	(6,78%)	68,2	(52)	(39)	(29)	0,655%
Rb	185	149	69,0	141	(59,0)	(140)	-	-	-	(52)
S	-	(0,26%)	(420)	(0,1%)	(6,5%)	0,208%	-	0,15%	0,83%	(50)
Sb	17,6	(5,72)	(1,94)	(3,73)	(1,40%)	(6)	(9)	(6)	(3)	(45)
Sc	24,2	20,7	(36,7)	29,2	(1,5)	(41)	(32)	(17)	(24)	-
Se	(4,6)	(10)	(10)	(6,0)	(682)	10,26	(7)	(0,8)	(17)	27
Si	22,48%	(26,4%)	(22,9%)	(25%)	(2,51%)	23,02%	24,06%	25,85%	16,83%	-
Sm	10,9	(9,45)	(21,9)	(13,6)	-	(20)	-	-	-	-
Sn	-	(31)	(26)	(27)	(0,224%)	-	-	-	-	-
Sr	250	283	(574)	401	(41,8)	1041	(700)	(2000)	(2700)	-
Ta	2,11	(1,22)	(13)	(4,37)	-	(1,8)	-	-	-	-
Tb	1,38	(1,3)	(1,93)	(1,41)	-	(2,6)	-	-	-	-
Th	29,4	(15,3)	23,9	22,1	-	25,7	(25)	(25)	(26)	(7,4)
Ti	(0,58%)	0,46%	3,68%	1,37%	(432)	0,791%	0,75%	0,52%	0,90%	(0,40%)
Tl	-	(2)	(1,5)	(2)	(<1,00)	(5,9)	-	-	-	-
Tm	0,705	-	-	-	-	(2,1)	-	-	-	-
U	15,1	(7,29)	(9,44)	(7,36)	-	8,79	-	-	-	5,5
V	260	191	553	375	(15)	295,7	-	-	-	127
W	10,5	(6,7)	(25)	(6,0)	-	(5,6)	-	-	-	(4,8)
Y	45,0	(26)	(30)	(29)	-	-	-	-	-	-
Yb	4,24	(3,49)	(4,41)	(3,63)	-	(7,6)	-	-	-	-
Zn	569	149	219	(251)	(5,76%)	(210)	(240)	(120)	(120)	0,476%
Zr	-	(222)	(822)	361	(29)	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-

Fly ash on artificial filters BCR 128

The material consists of a methyl cellulose foil mounted on polythene backed paper in a petrislide (diameter 4,7 cm) of standard size to fit common XRF- and PIXE- equipment. Each foil with a thickness of 10-15 µm contains a certified amount of BCR CRM 038 with particle size smaller than 10µm. The surface density is in the range: 250 - 275 µg/cm². Each sample is certified individually. Each unit consists of: one blank and one fly ash charget foil.

Element	As	Co	Cu	Fe	Mn	Na	Pb	Zn
Uncertainty (%)	5,7	4,6	5,9	3,7	4,5	5,0	5,2	5,8

The "filters " are intended for the verification of the calibration in XRF- and PIXE-analysis of similar types of (air borne) dust. A "filter" normally lasts for at least ten measurements in vacuum or twenty- five in air.

Úlety, popílky, aerosoly

1.4.

	NIST 2678 Blank Cellulose Acet Memb. Filter Set of 10 $\mu\text{g}/\text{filtr}$	NIST 2681 Blank Ashless Filter Set of 10 $\mu\text{g}/\text{filtr}$
Al	0,03-0,42	0,10-0,86
Sb	0,0004-0,001	0,0001-0,008
As	<0,0006	0-0,001
Ba	<0,2	<0,16
Cd	<0,006	<0,005
Cs	<0,002	<0,002
Ca	1,2-2,4	1,1-3,5
Ce	<0,004	<0,003
Cl	10-14	7-12
Cr	0,06-0,22	0,03-0,66
Co	0-0,003	<0,002
Cu	0-0,09	0-0,08
Au	0-0,32	0,008-0,95
I	0,004-0,008	0-0,004
Fe	0-1,3	0-1,0
La	0-0,0006	0-0,0008
Mb	0,8-2,1	0-1,2
Mn	0,005-0,02	0,003-0,016
Mo	<0,005	<0,004
K	0-2,2	<0,8
Rb	>0,05	<0,04
Sm	0-0,002	0-0,08
Sc	<0,0002	0-0,06
Se	<0,010	<0,008
Ag	<0,015	<0,012
Na	8,2-13,2	5,2-7,1
Sn	<0,8	<0,6
Ti	0-0,10	0-0,21
V	0-0,0007	0-0,001
Zn	0-1,1	0-0,08
Cl-	4,5-7,9	4,3-7,7
F-	<1	<1
K+	0,33-0,80	<1
Na+	7,3-12,1	2,2-3,6
NO3-	4,7-8,5	0,82-4,7
SO4-	<3	<1,5

	WF A1 Welding Filter 1x37 mm $\mu\text{g}/\text{filtr}$	WF B1 Welding Filter 1x37 mm $\mu\text{g}/\text{filtr}$	RT 002 Act. Charcoal Filter 100g mg/kg	RT 004 Diatoma c. Earth Filter 100g mg/kg
Ag	-	-	18	-
Al	86	56	-	-
As	-	2,1	-	-
B	200	86	-	-
Ba	148	71	-	1595
Be	0,8	0,4	-	-
Ca	87	97	-	-
Cd	14	9	-	2
Cr	185	93	36339	21
Co	35	21	-	-
Cu	678	374	96935	-
Fe	648	605	-	-
Hg	9,4	6,8	-	-
Mg	56	40	-	-
Mn	349	216	-	-
Mo	23	19	-	-
Ni	82	49	-	-
Pb	33	24	-	11871
Sb	15	7,1	-	-
V	14	7	-	-
Zn	320	170	-	-

	NIST 2556 Used Auto Catalyst 70g mg/kg	NIST 2557 Used Auto Catalyst 70g mg/kg
Pt	697,4	1131
Pd	326,0	233,2
Rh	51,2	135,1
Pb	6228	13931

NIST 2583 Indoor 8g mg/kg	
As	7,0
Cd	7,3
Cr	80
Pb	85,9
Hg	1,56

Úlety, popílky, aerosoly

1.5.

	BCR 038	BCR 723	RT 014	RT 019	RT 205	GBW 8401	GBW 8402	CAN PD1
	Coal Fly Ash	Road Dust	Baghouse Dust	Incin Ash	Incin Ash	Coal Fly Ash	Coal Fly Ash	Non Ferous Dust
	5g		50g	50g	225g	30g, 50g	50g	200g
	mg/kg		mg/kg	mg/kg	mg/L	µg/g	µg/g	%
Ag	-	-	(10)	7,35	0,1	-	-	-
Al	-	-	(6000)	(32800)	-	-	-	-
As	48	-	(2)	77,2	42,5	11,4	-	0,77
B	-	-	(50)	(336)	-	-	-	-
Ba	-	-	(1930)	352	0,339	(1450)	-	-
Be	-	-	-	(2)	-	10,7	-	-
Ca	-	-	(1150)	(51949)	-	-	-	-
Cd	4,6	-	510	432	149	0,16	-	(0,28)
Cl	323	-	-	-	-	-	-	-
Co	53,8	-	(10)	(26)	-	33,2	-	-
Cr	192	-	618	55,2	3,97	60	-	-
Cu	176	-	(30)	279	-	53	-	(7,03)
F	538	-	-	-	-	-	114	-
Fe	33800	-	(1400)	(12700)	-	7,65%	-	(12,2)
Hg	2,1	-	-	(2)	0,01	(0,039)	-	0,0389
K	-	-	(340)	(49300)	-	-	-	-
Mg	-	-	(403)	6310	-	-	-	-
Mn	479	-	(120)	(480)	-	1178	-	-
Na	3740	-	(780)	(50500)	-	-	-	-
Ni	(194)	-	(10)	22,2	-	-	-	-
Pb	262	-	643	4540	45,3	33,8	-	2,75
Pd	-	6,0	-	-	-	-	-	-
Pt	-	81,3	-	-	-	-	-	-
Rh	-	12,8	-	-	-	-	-	-
S	-	-	-	-	-	-	-	(8,23)
S(SO4)	-	-	-	-	-	-	-	(4,27)
Sb	-	-	(20)	(223)	-	-	-	-
Se	-	-	(1)	4,11	0,1	1,13	-	-
Si	-	-	-	-	-	-	-	(3,05)
Sr	-	-	(1900)	(173)	-	-	-	-
Th	(17,3)	-	-	-	-	-	-	-
Ti	-	-	(130)	(2870)	-	-	-	-
Tl	-	-	(10)	(42)	-	-	-	-
V	(334)	-	(2)	28,9	-	95	-	-
Zn	581	-	-	22400	-	61	-	(35,9)
H2O	-	-	-	-	-	-	-	(0,4)

NIST 2783		
Air particulate on filter media		
	2 filters	2filters blank
	ng/filter	ng/filter
Al	23210	(30)
As	11,8	-
Ba	335	(0,4)
Ca	13200	-
Ce	(23,4)	-
Co	7,7	(0,04)
Cr	135	70
Cu	404	-
Fe	26500	-
K	5280	-
Mg	8620	-
Mn	320	-
Na	1860	(15)
Ni	68	8
Pb	317	(0,4)
Rb	(24,0)	-
S	(1050)	(100)
Sb	71,8	-
Sc	(3,54)	-
Si	(58600)	-
Sm	(2,04)	-
Th	(3,23)	-
Ti	1490	-
U	(1,234)	-
V	48,5	-
W	(5,0)	-
Zn	1790	(50)

LGC 6180 pouze RM		
Pulverised Fuel Ash		
5x50g		
	mg/kg	mg/kg
	Extractable	Total
Al	25700	(131000)
Sb	(12)	(16)
As	91,7	(100)
Ba	676	(1300)
Be	(2,3)	(6)
B	(25)	(9200)
Ca	6415	(140)
Cr	43,8	(41)
Co	18,5	(130)
Cu	67,9	(52400)
Fe	(32900)	(110)
Pb	48,6	(130)
Li	(46)	(8500)
Mg	3660	(410)
Mn	259	(5)
Hg	(0,5)	(110)
Ni	48,5	(29600)
K	6170	(3)
Se	(2)	(5100)
Na	1230	(7)
Ti	(610)	(4400)
V	105	(260)
Zn	115	(260)

	HPS QC-TMFM-A	HPS QC-TMFM-B	HPS QC-TMFM-C	HPS QC-TMFM-D	HPS QC-TMFM-E
Metals on Filter Media					
	10 Filters+ 5 Blanks	10 Filters+ 5 Blanks	10 Filters+ 5 Blanks	10 Filters+ 5 Blanks	10 Filters+ 5 Blanks
	µg/filtr	µg/filtr	µg/filtr	µg/filtr	µg/filtr
Al	-	-	-	50	100
As	10,0	50	100	10	20
Ba	2,5	10	25	2,5	5
Be	1,0	10	25	0,1	0,2
Cd	1,0	10	25	1,0	2
Cr	2,5	10	25	2,5	5
Co	2,5	10	25	2,5	5
Cu	2,5	25	50	2,5	5
Fe	2,5	25	50	2,5	5
Pb	2,5	25	50	2,5	5
Mn	1,0	10	25	1,0	5
Ni	2,5	10	25	2,5	5
Se	5,0	25	50	5	10
Ag	1,0	5	10	1	2
Tl	2,5	10	25	2,5	5
V	2,5	10	25	2,5	5
Zn	2,5	50	100	2,5	5

BCR 176R	
Fly Ash	
40g	
	mg/kg
As	54
Cd	226
Co	26,7
Cr	810
Cu	1050
Fe	13100
Hg	(1,60)
Mn	(730)
Ni	117
Pb	5000
Sb	850
Se	18,3
Tl	1,32
V	(35)
Zn	16800

	NH Q-1	NH Q-2	NH Q-3	NH Q-4
α - quartz*				
	50g	50g	50g	50g
	Wt. %	Wt. %	Wt. %	Wt. %
α-Si dinas	4	9	19	38
	Rem.	Rem.	Rem.	Rem.

	NIST 2556	NIST 2557
Used Auto Catalyst		
	70g	70g
	mg/kg	mg/kg
Pt	697,4	1131
Pd	326,0	233,2
Rh	51,2	135,1
Pb	6228	13931

	NIST 1878a	NIST 1879a
Respirable α-Quartz		
	5g	Cristobalite
	5g	5g
	%	%
α-quartz	100 ± 0,21	-
cristobalite	-	95,6 ± 0,4

* Set of reference materials of alpha quartz content in silica matrix for powder X-ray diffraction

* pouze jako referenční materiál