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CRM ACID BASE ACCOUNTING

certified values		informational values listed in mass %															100 g units			
Number	Total S%	Al	Ba	C	CO ₂	CO ₃	Ca	Fe	K	Mg	Mn	Na	P	S	as SO ₄	Si	Ti	LOI	LOM	Total
CAN NBM-1	0.28	7.86	0.117	0.79	.	0.50	2.30	4.09	2.36	1.39	0.046	2.70	0.10	0.02	28.47	0.335	3.45	0.32	98.38	.
CAN KZK-1	0.80	7.37	0.27	0.95	3.37	4.22	1.80	3.30	3.55	0.95	0.07	1.18	0.08	0.01	29.38	0.35	.	.	.	.

values listed in kgCaCO₃/t

Number	Paste PH	Acid Producing Potential		Neutralization Potential		Fizz Rating	
		Sobek	Modified Sobek	Sobek	Modified Sobek	Sobek	Modified Sobek
CAN NBM-1	8.45	8.73	8.46	(49.6)	(70.9)	(46.6)	(52.3)
CAN KZK-1	(8.8)	24.9	(24.6)	59.0	64.8	58.9	(61.6)

CRM AIR PARTICULATE ON FILTER MEDIA

NIOH: 1 filter, analysis in µg, not for xrf SRM: 2 loaded + 2 blank filters, analysis in ng, good for nondestructive analysis

Number	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Mg	Mn	Mo	Na	Ni
NIOH A3	225	7.65	(38)	37.4	1.48	15.0	37.3	47.8	75.0	521	74.5	150	37.6	.	60.3
NIOH B3	110	3.76	(18)	18.4	0.73	7.35	18.3	23.5	36.9	256	36.6	73.6	15.9	.	29.7
SRM 2783 loaded *	23210	11.8	.	335	.	.	7.7	135	404	26500	8620	320	.	1860	68
SRM 2783 blank	(30)	.	.	(0.4)	.	.	(0.04)	(70)	.	.	.	.	.	(15)	(8)

Number	Pb	Pt	S	Sb	Sn	Sr	Ti	Tl	V	W	Zn	Zr
NIOH A3	37.0	35.2	.	37.5	37.7	35.2	37.0	2.61	15.5	(38)	226	37.3
NIOH B3	18.2	17.3	.	18.4	18.6	17.3	17.8	1.28	7.61	(19)	111	18.3
SRM 2783 loaded *	317	.	(1050)	71.8	.	.	1490	.	48.5	(5.0)	1790	.
SRM 2783 blank	(0.4)	.	(100)	.	.	.	.	.	.	(50)	.	.

* SRM 2783 loaded also has certified Ca: 13200, K: 5280; informational Ce: 23.4, Rb: 24.0, Sc: 3.54, Si: 58600, Sm: 2.04, Th: 3.23, and U: 1.234.

CRM ATTRITION INDEX

Number	Attrition Index (AI units)	Standard Deviation	Uncertainty @ 95% CL	Units
ASCRM 025	18.8	± 1.3	± 2.6	750 g

RM CALCIUM ALUMINATE

typical analysis

100 g

Number	Al ₂ O ₃	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	MnO	MoO ₃	S	SiO ₂	SrO	TiO ₂	V ₂ O ₅
DH X0101	72.2	26.74	0.006	0.118	.	0.191	0.008	.	0.011	0.17	.	.	<0.005
DH X0103	68.8	23.38	0.028	0.289	0.296	3.53	0.024	0.014	.	0.450	0.009	0.067	2.36
DH X0102	64.30	18.34	0.054	0.708	.	12.54	0.114	.	0.020	2.02	0.024	0.165	1.48

CRM CALCIUM CARBONATE

certified analysis in mass % and mg/kg

analysis in mg/kg

BAM: 100 g

SRM: 20 g units

Number	CaCO ₃	CO ₃	Ca	Ba	Cr	Cu	Fe	Mg	Mn	Na	Sr	Zn	Al	B	Cd	Co	Ga	K	La	Ni	Pb	Si	Sn	Ti	Zr
SRM 915b	99.907	59.923	40.0104	(2)	.	.	.	(40)	.	(17)	(150)	.	Cl: (8)	P: (3)	S: (30)	.	.	.	.	.	(5)	.	.	.	.
BAM RS 3	99.79	.	.	45.3	<1	<1	<5	183	3.0	47.5	173	<2	<5	<1	<0.5	<1	<1.5	<20	<0.5	<3	<0.1	<20	<1	<0.5	<0.2

RM PORTLAND CEMENT WITH EXTENSIVE ANALYSIS

analysis listed in mass %

~35 g units

Number	Al ₂ O ₃	CaO	T.Fe ₂ O ₃	K ₂ O	MgO	MnO	P ₂ O ₅	SiO ₂	Sr	TiO ₂
IAG OPC-1	4.55	62.9	3.19	0.344	2.58	0.404	(0.044)	21.85	0.01182	0.318

continued analysis listed in mg/kg

Number	As	Ba	Be	Ce	Co	Cs	Cu	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Li	Lu
IAG OPC-1	(4.6)	512	(0.82)	48.9	21.4	1.00	(23.7)	2.87	1.52	1.00	7	3.75	2.12	0.55	25.9	(13.1)	0.20

Number	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sm	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zn	Zr
IAG OPC-1	4.9	24.7	(87.0)	(7.2)	6.2	14.7	0.26	4.5	(0.35)	0.52	3.93	0.21	0.83	(64.0)	(0.7)	15.5	1.34	27.8	81.2

CEMENT chart 1 of 2

= class, where 1 = CRM and 2 = RM

analysis listed in mass %

#	Number	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	P ₂ O ₅	SO ₃	SrO	TiO ₂	LOI	Units
1	BCS 354	70.0	21.8	4.84	0.30	0.11	0.42	0.10	0.12	2.25	0.11	(0.04)	.	100 g
1	FLX CRM110	68.13	22.01	4.70	0.18	0.94	0.65	0.05	0.037	2.88	0.041	0.170	(3.46)	30 g
1	SRM 1886a	67.87	22.38	3.875	0.152	0.093	1.932	0.021	0.022	2.086	(0.018)	0.084	(1.56)	4 x 5 g
1	FLX CRM107	67.19	21.81	4.23	1.29	0.70	0.70	0.18	0.160	3.13	0.151	0.194	(6.59)	30 g
1	FLX CRM109	66.45	20.39	4.25	2.32	1.06	1.59	0.18	0.052	3.11	0.144	0.203	(5.96)	30 g
2	JCA RM 611	66.25	21.84	5.41	3.20	0.34	1.08	0.40	0.59	0.25	0.28	0.30	(0.51)	30 g
1	FLX CRM106	66.05	20.29	5.70	1.98	0.86	0.96	0.12	0.111	3.01	0.206	0.271	(2.06)	30 g
2	TL 1Ca	65.77	20.23	5.24	2.00	0.28	1.13	0.19	0.57	3.06	0.05	0.20	(1.39)	40 g
1	NCS DC62117	65.71	20.49	4.61	0.26	0.05	0.14	0.05	.	1.9	.	0.12	6.43	20 g
1	SRM 1889a	65.34	20.66	3.89	1.937	0.605	0.814	0.195	0.110	2.69	0.042	0.227	(3.28)	4 x 5 g
1	FLX CRM105	65.24	20.84	4.27	2.50	1.24	1.57	0.21	0.053	3.37	0.146	0.179	(2.61)	30 g
1	JCA CRM-1	65.21	20.99	5.26	2.67	0.56	2.13	0.26	0.28	2.05	0.05	0.35	(0.63)	60 g
1	FLX CRM108	65.15	20.06	4.66	2.97	0.74	2.15	0.09	0.169	3.31	0.083	0.186	(2.68)	30 g
1	NCS DC62103e	65.12	21.31	5.35	3.44	0.38	2.25	0.12	.	0.38	.	0.29	1.03	20 g
1	SRM 634a	65.07	20.493	5.015	3.362	0.3572	1.0057	0.0842	0.1767	2.780	(0.0735)	0.2463	(1.66)	100 g
1	BCS 353	64.8	20.5	3.77	4.82	0.49	2.42	0.10	0.077	2.25	0.23	0.16	.	100 g
1	FLX CRM100	64.51	20.89	5.54	2.62	0.82	1.47	0.23	0.166	2.97	0.286	0.283	2.37	50 g
2	JCA 211R	64.37	20.77	5.67	2.65	0.44	1.16	0.22	0.10	2.13	.	0.31	1.86	30 g
2	JCA 211S	64.25	20.57	5.60	2.51	0.40	1.26	0.27	0.14	2.10	.	0.30	2.19	40 g
1	CCRL 192	64.20	20.86	4.77	2.05	0.422	3.09	0.185	0.097	2.81	.	0.36	1.13	30 g
1	SRM 1880b	64.16	20.42	5.183	3.681	0.646	1.176	0.0914	0.2443	2.710	(0.0272)	0.236	(1.666)	4 x 5 g
1	SRM 633a	64.129	22.38	2.911	3.738	0.391	1.1532	0.203	0.14263	2.178	(0.0507)	0.2157	(2.460)	4 x 5 g
1	FLX CRM113	63.63	20.98	5.06	2.75	0.619	2.49	(0.092)	0.135	2.47	0.064	0.231	(1.53)	30 g
1	SRM 1888b	63.13	20.42	4.277	3.062	0.658	3.562	0.1364	0.07307	2.634	0.1099	0.2316	(various)	4 x 5 g
2	JCA RM 613	63.00	19.51	5.36	2.78	1.20	1.07	0.23	0.15	6.07	0.15	0.35	(3.45)	30 g
2	JCA RM 612	62.95	20.12	5.19	2.81	0.90	1.52	0.52	1.02	4.51	0.045	0.28	(2.52)	30 g
1	NCS DC62101b	62.76	20.88	4.48	2.64	0.66	2.05	0.11	.	2.98	.	0.32	3.00	20 g
2	CCRL 173	62.45	20.01	4.49	2.62	0.447	3.03	0.309	0.192	4.10	.	0.27	2.02	30 g
2	CCRL 174	62.43	20.75	3.71	3.62	0.430	4.83	0.189	0.067	2.64	.	0.21	1.14	30 g
1	SRM 1885b	61.87	20.05	4.70	3.044	0.497	3.86	0.293	0.0737	2.832	0.0795	0.2361	(2.310)	4 x 5 g
2	CCRL 172	61.78	19.30	4.66	2.93	0.935	4.74	0.267	0.111	3.21	.	0.26	2.09	30 g
1	SRM 1884b	61.31	19.30	4.851	2.937	0.957	4.74	0.278	0.0965	4.034	0.0258	0.2651	(various)	4 x 5 g

Number	CO ₂	Free CaO	Cl	Cr ₂ O ₃	F	Mn	MnO	Mn ₂ O ₃	S	ZnO	Ins. Res.
BCS 354	.	.	.	.	.	.	.	0.058	.	.	.
FLX CRM110	.	.	0.008	0.004	.	.	0.029	.	.	0.003	.
SRM 1886a	.	.	(0.0042)	0.0024	(0.02)	.	.	0.0073	.	(0.001)	(0.23)
FLX CRM107	.	.	0.043	0.006	.	.	0.040	.	.	0.013	.
FLX CRM109	.	.	0.049	0.008	.	.	0.051	.	.	0.042	.
JCA RM 611	.	.	.	.	.	.	0.06	.	.	.	.
FLX CRM106	.	.	0.055	0.008	.	.	0.161	.	.	0.012	.
TL 1Ca	.	(0.83)	.	.	.	.	.	.	.	.	(0.21)
NCS DC62117	.	.	.	.	.	.	.	.	.	.	.
SRM 1889a	.	.	(0.0019)	0.0072	(0.05)	.	.	0.2588	.	0.0048	(0.66)
FLX CRM105	.	.	0.049	0.008	.	.	0.040	.	.	0.054	.
JCA CRM-1	.	.	.	.	.	0.06	.	.	.	.	.
FLX CRM108	.	.	0.042	0.007	.	.	0.219	.	.	0.036	.
NCS DC62103e	.	.	.	.	.	.	.	.	.	.	0.34
SRM 634a	.	(1.86)	.	(0.0114)	.	.	.	(0.0229)	.	(0.0222)	(0.21)
BCS 353	.	.	.	.	.	.	.	0.23	.	.	.
FLX CRM100	.	.	(0.09)	0.009	.	.	.	0.066	.	0.051	.
JCA 211R	.	.	0.009	.	.	0.07	.	.	.	.	0.08
JCA 211S	.	.	0.022	.	.	.	0.05	.	.	.	0.23
CCRL 192	.	0.87	0.031	0.014	.	.	.	0.077	.	0.016	0.20
SRM 1880b	.	(2.227)	0.01830	0.01927	(0.0539)	.	.	0.1981	(0.0131)	(0.01054)	(0.487)
SRM 633a	.	(1.60)	0.0087	(0.0124)	(0.038)	BaO: (0.256)	.	0.1176	(0.049)	0.123	(0.23)
FLX CRM113	.	.	.	(0.007)	.	.	.	0.233	(0.137)	0.030	Hg: 0.02470 mg/kg
SRM 1888b	.	(1.42)	0.0143	(0.01021)	(0.048)	.	.	0.0652	(0.15)	(0.01253)	(0.32)
JCA RM 613	.	.	.	.	.	.	0.08	.	.	.	.
JCA RM 612	.	.	.	.	.	.	0.06	.	.	.	.
NCS DC62101b	.	.	.	.	.	.	.	.	.	.	0.75
CCRL 173	0.6	1.65	0.023	0.009	.	.	.	0.060	.	0.024	0.36
CCRL 174	.	1.04	0.005	0.006	.	.	.	0.073	.	0.014	0.26
SRM 1885b	.	(0.27)	(0.0021)	0.02709	(0.0524)	.	.	0.1282	(0.042)	0.0354	(0.36)
CCRL 172	1.38	1.04	0.008	0.009	.	.	.	0.088	.	0.004	0.44
SRM 1884b	.	(0.418)	(0.0065)	0.00791	(0.0394)	.	.	0.0750	.	.	(0.159)

last of stock

SO₄ as SO₃: 2.40

last, expires 12/31/2014

last, expires 12/31/2014

BaO: 0.0149

last, expires 12/31/2014

CEMENT chart 2 of 2

= class, where 1 = CRM and 2 = RM

analysis listed in mass %

#	Number	CaO	Ca	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	P ₂ O ₅	SO ₃	SrO	TiO ₂	LOI	Units
1	SRM 1887b	61.15	.	19.59	4.911	2.471	0.961	3.624	0.288	0.1540	4.599	0.2625	0.2034	2.121	5 x 4 g
1	NCS DC62118	60.99	.	21.73	4.75	4.12	0.43	4.37	0.12	.	2.27	.	0.23	0.81	20 g
1	CCRL 191	60.44	.	21.34	4.05	3.56	0.654	4.07	0.198	0.054	3.43	.	0.21	2.15	30 g
1	FLX CRM122	59.00	.	21.94	5.60	1.67	0.900	2.02	0.204	0.066	(3.27)	0.131	0.353	(4.86)	30 g
1	NCS DC62102e	57.95	.	21.00	5.83	2.44	1.02	4.25	0.19	.	2.28	.	0.50	4.10	20 g
1	NCS DC62116	57.86	.	16.34	4.01	2.22	0.55	2.28	0.11	.	2.3	.	0.22	13.86	20 g
1	SRM 1881a	57.58	.	22.26	7.060	3.09	1.228	2.981	0.199	0.1459	3.366	0.036	0.3663	(1.59)	4 x 5 g
1	NCS DC62102d	57.25	.	23.54	6.60	3.25	0.71	1.88	0.15	.	2.74	.	0.39	3.13	20 g
2	TL 203Ca	57.09	.	18.75	4.78	2.34	0.93	4.80	0.21	(0.13)	3.28	(0.06)	0.24	(7.24)	40 g
1	JCA CRM-2	56.33	.	25.66	8.94	2.08	0.31	3.05	0.24	.	(2.59)	0.07	0.50	(0.47)	60 g
1	FLX CRM118	55.47	.	21.57	6.94	3.88	0.983	2.08	0.181	0.163	(2.97)	0.087	0.301	5.02	30 g
1	FLX CRM103	54.90	.	26.95	7.75	1.78	0.77	4.44	0.33	0.09	2.73	0.070	0.372	(0.59)	50 g
1	TL 201C	54.48	.	25.63	6.81	2.08	0.73	3.35	0.32	.	3.16	.	.	1.96	40 g
1	FLX CRM117	54.22	.	28.05	7.68	1.37	0.916	2.95	0.223	(0.035)	(3.49)	0.098	0.564	(0.402)	30 g
1	FLX CRM115	53.93	.	27.29	8.13	0.972	0.612	2.93	0.194	0.073	(3.90)	0.117	0.610	(1.56)	30 g
1	FLX CRM119	53.78	.	24.04	7.36	3.04	1.23	1.34	0.292	0.153	(2.43)	0.158	0.347	5.73	30 g
1	FLX CRM120	53.63	.	26.51	7.64	1.11	0.692	3.55	0.184	0.086	(4.35)	0.124	0.598	(1.71)	30 g
1	FLX CRM114	51.29	.	28.61	6.94	1.37	0.954	4.93	0.277	0.027	(4.07)	0.108	0.525	(1.28)	30 g
1	FLX CRM116	50.05	.	30.81	9.11	0.86	0.693	4.47	0.201	0.034	(3.14)	0.091	0.690	(-0.394)	30 g
1	TL 200Ca	49.97	.	26.55	8.72	4.07	1.10	2.06	0.21	0.45	2.84	0.13	0.46	(3.30)	40 g
1	FLX CRM101	48.24	.	30.31	8.81	3.52	2.10	1.70	0.68	0.191	3.16	0.248	0.469	3.84	50 g
2	DH X0210	46.72	33.39	30.30	9.99	1.66	0.541	4.96	0.236	0.066	.	0.077	0.421	.	100 g
1	TL 202C	45.12	.	29.61	10.14	3.27	1.05	4.46	0.32	.	3.17	.	.	1.51	40 g
1	FLX CRM121	44.45	.	30.81	8.78	3.04	2.73	1.41	1.23	0.112	2.55	0.140	0.344	4.24	30 g
1	NCS DC62105f	44.04	.	12.58	2.81	1.78	0.48	1.16	0.09	.	0.10	.	0.22	36.55	20 g
1	NCS DC62104b	39.65	.	12.77	3.66	2.02	0.93	1.20	0.18	.	0.72	.	0.18	38.32	20 g
1	SRM 1882a	39.29	.	4.01	39.14	14.67	0.051	0.51	0.021	(0.070)	.	(0.024)	1.786	(0.20)	4 x 5 g
1	DH X0202 *	38.01	.	4.08	39.31	15.83	0.111	0.487	0.033	0.043	0.105	.	1.81	.	100 g
1	SRM 1883a	29.52	.	0.24	70.04	0.078	0.014	0.19	0.30	(0.003)	.	(0.019)	(0.020)	(0.35)	4 x 5 g
2	DH X0209	.	48.78	21.95	4.63	0.204	1.01	0.717	0.078	0.043	.	0.051	0.095	.	100 g
2	DH X0212	.	46.48	21.16	4.41	3.94	0.495	0.945	0.084	0.191	.	0.086	0.242	.	100 g
2	DH X0211	.	40.63	25.04	6.86	2.98	0.524	2.79	0.156	0.137	.	0.083	0.319	.	100 g

Number	BaO	Free CaO	Cl	Cr ₂ O ₃	F	Mn	Mn ₂ O ₃	S	Unignited SO ₃	V ₂ O ₅	ZnO	Ins. Res.
SRM 1887b	(0.022)	0.21	0.01001	0.01551	0.101	.	0.0957	0.025	.	.	0.01560	0.26
NCS DC62118	.	.	.	.	.	.	.	.	.	.	.	1.18
CCRL 191	.	1.64	0.013	0.009	.	.	0.033	.	.	.	0.029	0.43
FLX CRM122	.	.	.	(0.004)	.	.	0.111	(0.288)	SO ₄ as SO ₃ : 2.62	.	0.027	.
NCS DC62102e	.	.	.	.	.	.	.	.	.	.	.	.
NCS DC62116	.	.	.	.	.	.	.	.	.	.	.	.
SRM 1881a	.	.	(0.013)	0.0588	(0.09)	.	0.1042	.	.	.	0.0489	(5.2)
NCS DC62102d	.	.	.	.	.	.	.	.	.	.	last	.
TL 203Ca	.	(1.23)	.	.	.	.	.	.	.	.	.	(0.58)
JCA CRM-2	.	.	.	.	.	0.15	.	(0.32)	(1.91)	.	.	.
FLX CRM118	.	.	.	0.009	.	.	0.176	(0.131)	SO ₄ as SO ₃ : 2.89	.	0.053	.
FLX CRM103	.	.	(0.040)	0.007	.	.	0.170	.	.	.	0.014	.
TL 201C	.	.	0.06 Cl-	.	.	.	.	0.31 S ₂ -	.	.	.	.
FLX CRM117	.	.	.	(0.004)	.	.	0.193	(0.602)	SO ₄ as SO ₃ : 1.80	.	0.024	.
FLX CRM115	.	.	.	(0.004)	.	.	0.214	(0.611)	SO ₄ as SO ₃ : 2.41	.	0.008	.
FLX CRM119	.	.	.	0.008	.	.	0.040	(0.029)	SO ₄ as SO ₃ : 2.38	.	0.040	.
FLX CRM120	.	.	.	(0.005)	.	.	0.188	(0.632)	SO ₄ as SO ₃ : 3.18	.	0.008	.
FLX CRM114	.	.	.	(0.005)	.	.	0.154	(0.676)	SO ₄ as SO ₃ : 2.50	.	0.022	.
FLX CRM116	.	.	.	(0.005)	.	.	0.238	(0.737)	SO ₄ as SO ₃ : 1.22	.	0.015	.
TL 200Ca	.	(0.34)	.	.	.	.	.	.	.	.	.	(17.42)
FLX CRM101	.	.	(0.05)	0.010	.	.	0.118	.	.	.	0.044	.
DH X0210	0.071	.	.	.	.	.	0.327	1.77	.	0.011	.	.
TL 202C	.	.	0.01 Cl-	.	.	.	.	0.20 S ₂ -	.	.	.	.
FLX CRM121	.	.	.	0.008	.	.	0.111	(0.025)	SO ₄ as SO ₃ : 2.37	.	0.031	.
NCS DC62105f	.	.	.	.	.	.	.	.	.	.	.	.
NCS DC62104b	.	.	.	.	.	.	.	.	.	.	.	.
SRM 1882a	.	.	.	(0.113)	.	.	(0.060)	.	.	.	(0.004)	.
DH X0202 *	.	.	(<0.01)	0.009	.	.	0.039	.	* more certified trace data listed in database			
SRM 1883a	.	.	.	(0.006)	.	.	(0.003)	.	.	.	.	.
DH X0209	0.028	.	.	.	.	.	0.025	1.19	.	.	.	.
DH X0212	.	.	.	.	.	.	0.062	1.18	.	.	.	.
DH X0211	0.041	.	.	.	.	.	0.172	1.48	.	0.014	.	.

RM

CEMENT SET JCA 601B

available in set/15 only

number 1-14 powder 20 g number 15 powder 30 g

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	SiO ₂	SrO	TiO ₂
JCA 601B 1	5.10	59.07	2.37	1.191	1.31	0.404	0.809	1.479	9.83	17.61	(0.38)	0.282
JCA 601B 2	5.98	65.23	2.90	0.370	1.37	0.097	0.272	0.119	2.34	20.75	(0.06)	0.299
JCA 601B 3	4.45	63.18	2.37	0.696	2.36	0.050	0.373	0.758	5.97	19.11	(0.19)	0.222
JCA 601B 4	5.23	66.63	2.77	0.281	0.87	0.090	0.166	0.198	2.70	20.36	(0.04)	0.333
JCA 601B 5	3.28	64.96	3.37	0.355	1.02	0.058	0.199	0.111	1.79	24.41	(0.03)	0.189
JCA 601B 6	3.87	64.15	4.13	0.413	0.83	0.105	0.223	0.126	2.20	23.18	(0.03)	0.201
JCA 601B 7	2.82	63.36	3.14	0.398	0.80	0.037	0.153	0.096	2.57	26.27	(0.03)	0.164
JCA 601B 8	2.73	63.49	3.05	0.304	0.59	0.104	0.186	0.169	2.48	26.61	(0.02)	0.143
JCA 601B 9	7.94	58.91	2.07	0.320	2.49	0.081	0.328	0.110	.	24.53	(0.05)	0.370
JCA 601B 10	9.47	54.60	1.83	0.342	3.22	0.148	0.239	0.154	.	26.50	(0.05)	0.379
JCA 601B 11	8.89	55.64	1.98	0.337	2.96	0.181	0.311	0.283	.	26.11	(0.06)	0.399
JCA 601B 12	8.75	55.78	2.14	0.319	3.13	0.620	0.189	0.085	.	24.75	(0.04)	1.035
JCA 601B 13	11.03	50.51	1.10	0.291	4.20	0.112	0.348	0.055	.	28.61	(0.05)	0.449
JCA 601B 14	16.05	35.85	0.24	0.188	10.21	0.115	0.274	0.011	.	35.03	(0.05)	0.435
JCA 601B 15	2.07	75.62	7.01	0.000	0.01	0.002	0.030	0.003	0.02	14.87	(0.02)	0.004

CRM CHLORINE and FLUORINE in CEMENT

Number	Description	CaF ₂	F	Cl-	Units
NCS DC62121	Cement Raw Meal	.	.	0.029	20 g
NCS DC62122a	Cement	.	.	0.009	20 g
NCS DC62125a	Cement	(0.37)	0.18	.	20 g

CRM PORTLAND CEMENT HEAT OF HYDRATION

Number	Heat of Solution J/g	7 Days J/g	28 Days J/g	Units
JCA 301S	2,483.5	274.0	325.2	600 g

CRM COMPRESSIVE STRENGTH N/mm²

Number	3 Days	7 Days	28 Days	Units
JCA 401i	31.2	47.5	62.7	4.8 kg

CRM CLASSIC CEMENT CHEMISTRIES

20 g units

Number	P - Pozzolana	S - Slag	D - Limestone	D1 - CO ₂	R5 - Unsolved Slag (EDTA)	Description
NCS DC62119a	9.3	4.5	2.4	(1.50)	.	Ordinary Portland Cement
NCS DC62120	0.5	18.5	7	3.5	97.5	Portland Blast-Furnace Slag Cement

CRM CEMENT CLINKER PHASE ABUNDANCE

Number	Alite	Alkali Sulfates	Aluminate	Aphthitalite	Arcanite	Belite	Ferrite	Periclase	Units
SRM 2686a	63.53	0.86	2.46	(0.74)	(0.27)	18.80	10.80	3.40	3 x 10 g
SRM 2687	71.24	.	11.82	.	0.92	12.57	2.81	.	3 x 10 g
SRM 2688	64.95	.	4.99	.	.	17.45	12.20	.	3 x 10 g

CRM PORTLAND CEMENT FINENESS AND BLAINE STANDARD

Number	Remaining after passing through 80 micron sieve	Blaine	Density g/cm ³	Units
NCS DC62127e	2.68 %	356.8 m ² /kg	(3.05)	200 g
TL 201B	.	4,231 cm ² /g	3.03	40 g
TL 202B	.	4,135 cm ² /g	2.94	40 g
JCA 102N	.	3,300 cm ² /g	.	30 g

CRM CEMENT FINENESS

certified analysis

informational analysis listed in mass %

46H: 10 x 5 g units

114q: powder 20 x 5 g units

Surface Area			45 µm Sieve	C ₂ S	C ₃ S	C ₃ A	C ₄ AF	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	P ₂ O ₅	SO ₃	SiO ₂	TiO ₂	LOI
Number	Blaine	Wagner	Residue	C150-02				C114-02										
ASTM METHOD	C204-96a	C115-96a	C430-96															
SRM 114q	3818 cm ² /g	2183 cm ² /g	0.79 %	14	60	7	10	4.7	64.0	3.2	0.70	2.2	0.07	0.12	2.4	20.7	0.30	1.67
SRM 46h			7.43 %	15	59	8	8	4.9	63.9	2.8	0.68	1.9	0.19	0.21	2.9	20.6	0.30	1.5

CRM CEMENT FINENESS

particle size analysis detailed on certificates

40-50 g units

Number	Density g/cm ³	Blaine cm ² /g	C ₂ S	C ₃ S	C ₃ A	C ₄ AF	Al ₂ O ₃	CaO	F.CaO	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	P ₂ O ₅	SO ₃	SiO ₂	TiO ₂	Insol.	LOI
TL 2BGa	3.15	4,206	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
TL 9	3.15	4,175	12	62	7	9	4.66	64.00	1.09	3.01	0.76	2.20	0.26	0.07	2.74	20.47	0.20	0.45	1.46
TL 203BGa	3.05	4,329	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

RM CEMENT FINENESS - SIEVING METHOD

Number	45 µm	32 µm	20 µm	16 µm	10 µm	units	percent remaining, ordinary portland cement
JCA 701B	10.4	22.8	43.0	52.4	70.1	30 g	

CRM CEMENT COMPONENT MATERIAL

analysis listed in mass %

NCS DC61106: 50g

others: 20 g units

Number	Material	CaO	T.CaCO ₃	Al ₂ O ₃	SiO ₂	F	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	S	SO ₃	TiO ₂	LOI
NCS DC62110	Portland Blast Furnace Slag	57.4	.	6.26	23.48	.	2.39	0.59	3.31	0.17	.	2.02	0.43	3.68
NCS DC62109	Portland Pozzolanic	47.57	.	6.52	32.67	.	3.54	1.43	1.86	0.85	.	2.59	0.16	2.44
NCS DC62111	Portland Fly Ash	46.52	.	8.93	24.31	.	4.9	0.61	1.9	0.32	.	2.47	0.33	9.09
NCS DC62123	Sulphoaluminate Cement Clinker	43.4	.	32.6	8.56	.	2.21	0.22	1.37	0.09	.	9.55	1.51	0.41
NCS DC62126a	Cement Black Raw Meal	39.28	70.3	.	.	0.15	2.07	.	.	.	.	.	.	38.51
NCS DC62113	Granulated Blast Furnace Slag	35.62	.	12.23	34.93	.	1.26	0.54	10.66	0.42	0.61	1.17	1.06	1.05
NCS DC62112	Aluminate	34.56	.	51.15	7.95	.	1.91	0.13	0.63	0.04	0.1	.	2.03	0.68
NCS DC62124	Sulphoaluminate Cement Raw Meal	33.05	.	22.29	5.09	.	1.34	0.14	1.21	0.06	.	7.07	1.07	28.21
NCS DC62115	Fly Ash for Cement	4.42	.	36.62	48.93	.	4.37	0.57	0.84	0.17	.	0.35	1.46	1.76
NCS DC62114	Pozzolana for Cement	2.83	.	24.2	57.53	.	5.1	3.05	1.24	1.42	.	0.08	1.07	2.99
NCS DC61106	Albite Cement	0.48	.	19.62	67.96	.	0.10	0.098	0.015	11.26	.	.	0.054	0.36

CRM MAGNETIC CENOSPHERE FROM COAL POWER PLANTS

analysis listed in mass %

fine powder concentrate, 100 g units

Number	Al ₂ O ₃	Ba	CaO	CO ₂	F%	FeO	T.Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	S	SiO ₂	Sr	TiO ₂	Zr	LOI
VS 9234-2008	25.9	0.084	1.19	(0.43)	.	1.67	2.85	2.9	0.86	0.039	0.48	0.076	.	63.7	0.0217	0.74	0.026	(0.92)
VS 9235-2008	19.3	0.089	2.77	0.51	(0.2)	(2.4)	4.04	3.5	1.64	0.049	1.33	0.19	(0.07)	64.1	0.0480	0.78	0.0246	(1.6)
VS 9236-2008	2.6	0.38	8.2	(0.64)	.	(15.4)	(78.4)	0.12	(1.3)	(0.082)	0.27	(0.036)	0.86	7.7	0.17	0.21	0.0039	(0.42)

continued

analysis listed in mg/kg except

Number	Ag	As	Be	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	Ga	Gd	Ge	Hf	Ho	La	Li	Lu	Mo	Nb
VS 9234-2008	.	.	4.6	115	7.6	59	12	33	(6)	(3.5)	1.5	(11)	(7.3)	.	7.1	(1.2)	60	(42)	0.56	(16)	19
VS 9235-2008	(0.2)	(11)	2.8	89	11	66	8.6	34	(5.5)	(3.0)	1.4	9.3	(6.7)	(0.9)	(6.9)	(1.1)	46	(55)	0.53	(3.4)	15
VS 9236-2008	.	.	(0.7)	11	23	67	(0.21)	28	(1.0)	(0.6)	(0.5)	(3)	(1.2)	.	0.97	(0.19)	5.7	.	0.10	(4.6)	(3.1)

Number	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Sm	Sn	Ta	Tb	Th	Tl	Tm	U	V	Y	Yb	Zn
VS 9234-2008	48	30	17	(13)	116	(0.5)	13	8.4	(1.6)	(1.5)	(1.1)	19	(0.5)	(0.5)	4.3	60	34	3.5	28
VS 9235-2008	39	35	20	(10)	135	(1.3)	15	7.2	(2.3)	(1.2)	0.92	14	(0.7)	(0.5)	4.6	102	33	3.3	50
VS 9236-2008	(5.3)	62	3.5	(1.3)	3.8	(0.3)	2.5	1.0	(1)	(0.15)	(0.16)	1.4	(0.06)	(0.09)	(1.0)	26	5.6	0.50	38

COAL chart 1 of 2

#=class, 1=CRM and 2=RM mass % except * for mg/kg

ACIRS, AS(C)RM, COCO: 250 g

SABS: 100-150 g

USZ: as shown

others: 50 g

#	Number	S	Ash	Volatile Matter	Heat in J/g or BTU/lb	Density	Moisture	C	Fixed C	Cl	F	H	Hg*	N	O	P
1	IARM HC-30800A	8.6	23.9	35	(10,750 BTU, 25,050 J) (2)	57	42	(0.07)	(0.01)	4.1	(0.6)	1.1	(5.3)	As:(0.006)		
1	NCS FC28143	6.45	32.00	14.40	20,870 J	1.82	53.10	.	.	2.56	.	0.72	.	.	.	.
1	SRM 2685c	4.72	.	Br:(4.94*)	Mg:(0.0814)	Mn:(0.003684)	.	(0.05540)	.	0.1494	.	.	.	.	.	.
1	NCS FC28009h	4.68	26.43	19.19	23,810 J	1.69	60.30	.	.	2.95	.	0.98	.	.	.	.
2	502-686-10312	4.37	.	.	.	.	.	.	.	.	0.110	.	.	.	.	.
1	NCS FC28142	4.35	33.40	14.38	21,050 J	1.76	53.63	.	.	2.79	.	0.81	.	.	.	.
1	502-674-14157	4.16	10.70	.	.	.	.	.	.	.	.	.	.	.	.	17025
1	NCS FC28221	4.04	18.98	32.0	27,790 J	.	.	.	.	.	.	.	.	.	.	.
1	NCS FC28220	4.03	16.52	11.15	28,670 J	.	.	.	.	.	.	.	.	.	.	.
2	502-836-10076	3.99	12.57	(39.18)	(13,093) BTU	.	(70.18)	.	.	4.88	0.097	1.27	.	.	.	.
2	502-837-10182	3.26	9.00	(38.43)	(13,862) BTU	.	(72.64)	.	.	4.88	0.058	1.36	.	.	.	.
1	502-673-14178	3.24	8.67	.	.	.	.	.	.	.	.	.	.	.	.	.
1	NCS FC28210	3.17	25.80	8.77	24,130 J	.	.	.	.	.	.	.	.	.	.	.
1	CZ SF-06-14	3.13	27.21	27.36	23,990 J	10,314 BTU	58.28	.	.	3.51	.	3.80	.	.	.	.
1	NCS FC28012f	3.07	36.15	8.27	19,630 J	2.03	55.24	.	.	1.31	.	0.39	.	.	.	last
1	NCS FC28141	2.92	28.64	11.50	23,040 J	1.70	59.60	.	.	2.80	.	0.80	.	.	.	.
1	NCS FC28012g	2.89	21.69	11.11	26,090 J	1.65	67.68	.	.	2.78	.	1.00	.	.	.	.
1	NCS FC28008g	2.81	28.75	29.29	23,490 J	1.58	56.81	.	.	3.84	.	0.94	.	.	.	.
1	NCS FC28216	2.79	8.62	10.86	32,300 J	1.44	81.27	.	.	3.55	.	1.16	.	.	.	.
1	CZ SF-07-14	2.52	28.73	38.80	21,337 J	9,173 BTU	50.97	.	.	4.26	.	1.05	.	.	.	.
2	ACIRS M1	2.392	18.68	32.85	28,356 J	1.417	CO ₂ :0.037	67.40	.	(0.014)	0.0149	4.73	0.120	1.34	125 g	0.098
1	NCS FC28011f	2.36	16.92	7.15	27,820 J	1.72	74.97	.	.	2.06	.	0.89	.	.	.	.
1	NCS FC28215	2.17	25.2	28.79	24,830 J	.	.	.	.	.	.	.	.	.	.	.
2	502-839-09160	2.11	7.61	(37.69)	(11,661) BTU	.	(77.48)	.	.	5.14	0.132	1.47	.	.	.	.
2	COCO 026	2.10	31.63	9.69	22,680 J	.	.	.	.	.	.	.	.	.	.	.
2	502-672-13233	2.09	7.91	.	.	.	.	.	.	.	.	.	.	.	.	.
1	NCS FC28112	2.07	8.08	33.70	32,620 J	1.33	78.64	.	.	5.01	.	1.31	.	.	.	.
2	502-687-13233	2.06	.	.	.	.	.	.	.	.	0.130	.	.	.	.	.
2	COCO 012	2.00	26.49	23.32	23,280 J	.	59.24	.	.	3.08	.	1.45	.	.	.	0.012
1	SRM 2683C	1.955	(9.87)	(35.84)	(13,003) BTU	.	(3.185)	(73.38)	.	(0.1127)	(0.0082)	(4.886)	0.0900	(1.635)	.	.
1	NCS FC28007j	1.92	13.37	35.50	26,790 J	1.50	67.27	.	.	4.04	.	1.21	.	.	.	.
2	COCO 002	1.89	14.25	21.16	29,200 J	.	.	.	.	.	.	last of stock	.	.	.	0.037
1	NCS FC28217	1.79	8.68	36.06	31,330 J	.	.	.	.	.	.	.	.	.	.	.
1	NCS FC28209	1.76	27.33	8.21	23,960 J	.	.	.	.	.	.	.	.	.	.	.
1	NCS FC28010f	1.75	20.35	29.95	25,890 J	1.52	63.92	.	.	3.98	.	1.12	.	.	.	.
1	SABS 062	1.74	11.46	5.34	30,170 J	.	82.28	.	.	2.16	.	1.83	.	.	.	0.040
1	NCS FC28106	1.70	8.60	31.81	32,500 J	1.35	78.50	.	.	4.86	.	1.32	.	.	.	.
1	NCS FC28002j	1.61	23.73	30.08	23,760 J	1.58	59.95	.	.	3.63	.	1.06	.	.	.	last of stock
1	NCS FC28214	1.66	27.85	29.21	23,630 J	.	.	.	.	.	.	.	.	.	.	.
1	NCS FC28005g	1.59	13.03	8.39	29,730 J	1.61	78.63	.	.	2.58	.	1.16	.	.	.	.
1	NCS FC28002q	1.56	17.38	32.63	26,010 J	1.51	64.82	.	.	3.93	.	1.16	.	.	.	.
1	NCS FC28010g	1.56	13.54	22.75	29,370 J	1.46	73.98	.	.	3.79	.	1.21	.	.	.	.
1	NCS FC28144	1.55	73.18	9.83	6,770 J	2.29	17.81	.	.	1.48	.	0.25	.	.	.	waste rock
2	502-831-07331	1.50	6.94	(35.15)	(12,254) BTU	.	(74.61)	.	.	4.79	0.121	1.7	.	.	.	.
1	NCS FC28213	1.46	9.87	35.24	30,620 J	.	.	.	.	.	.	.	.	.	.	.
1	NCS FC28138	1.40	44.13	11.36	18,400 J	1.79	47.02	.	.	2.53	.	0.68	.	.	.	.
2	502-681-13324	1.37	9.30	33.6	(13,997) BTU	.	78.0	.	.	4.96	.	1.50	.	.	.	.
1	NCS FC28218	1.35	14.58	6.16	29,260 J	.	.	.	.	.	.	.	.	.	.	.
1	CZ SF-01-14	1.33	44.90	31.72	14,617 J	6,284 BTU	36.40	.	.	3.31	.	0.60	.	.	.	.
1	NCS FC28139	1.30	22.70	18.37	27,040 J	1.51	67.18	.	.	3.68	.	1.05	.	.	.	.
1	NCS FC28140	1.28	25.88	30.43	22,500 J	1.62	58.12	.	.	3.40	.	1.02	.	.	.	.
1	NCS FC28111	1.26	25.50	28.50	23,850 J	1.57	59.75	.	.	3.73	.	1.01	.	.	.	.
2	USZ TTKN	1.21	15.2	29.3	35,260 J	.	.	.	.	4.88	.	80, 150, or 200 g units	.	.	.	.

#	Number	S	Ash	Volatile Matter	Heat in J/g or BTU/lb	Density	Moisture	C	Fixed C	Cl	F	H	Hg*	N	O	P
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#=class, 1=CRM and 2=RM mass % except * for mg/kg ACIRS, AS(C)RM, COCO: 125 or 250 g SABS: 100-150 g USZ: as shown others: 50 g

#	Number	S	Ash	Volatile Matter	Heat in J/g or BTU/lb	Density	Moisture	C	Fixed C	Cl	F	H	Hg*	N	O	P
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RM FUSIBILITY OF COAL

analysis listed in mass %									250 g units				Reducing Temperature °C			
Number	C	H	N	P	S	MJ/Kg	Volatility	Ash	Deformation	Softening	Hemisphere	Flow				
COCO 005	81.70	4.57	1.44	0.015	1.05	32.90	27.19	7.49	1402	1425	1443	1473				
COCO 007	72.55	3.69	1.83	0.036	1.55	28.71	21.60	14.51	1329	1353	1381	1420				
COCO 005	81.70	4.57	1.44	0.015	1.05	32.90	27.19	7.49	1402	1425	1443	1473				
COCO 017	72.84	3.66	1.97	0.040	1.71	29.02	20.50	15.60	1291	1325	1365	1390				
COCO 007	72.55	3.69	1.83	0.036	1.55	28.71	21.60	14.51	1329	1353	1381	1420				
COCO 021	59.15	3.02	1.51	0.027	1.14	22.78	20.18	28.60	1380	1408	1430	1473				
COCO 016	56.64	2.64	1.53	0.030	1.86	21.92	18.26	31.32	1284	1317	1346	1387				
COCO 015	51.87	2.61	1.23	0.062	1.27	20.03	20.33	34.90	1425	1460	1497	1500				
COCO 018	.	.	.	0.049	1.61	29.32	18.33	15.59	1307	1351	1381	1428				
COCO 020	.	.	.	0.033	1.34	25.78	11.88	25.00	1263	1292	1331	1378				
COCO 023	.	.	.	0.024	1.17	23.86	21.38	25.77	1350	1393	1420	1448				

SULFUR IN COAL

= class, where 1=CRM and 2=RM

analysis listed in mass %

#	Number	S	Units	#	Number	S	Units	#	Number	S	Units
1	IARM HC20800A	8.6	50 g	2	VS1-2.33	2.33	50 g	1	BCR 332	0.961	20 g
1	IARM HC20500B	5.4	50g, last	2	VS1-2.07	2.07	50 g	2	VS1-0.93	0.93	50 g
1	ASCRM 012 D	5.21	125g, last	2	VS1-1.97	1.97	50 g	1	IARM HC20075C	0.76	50g, last
1	BCR 335	5.08	20 g	2	VS1-1.77	1.77	50 g	2	ACIRS S1B	0.71	250 g
2	VS1-4.25	4.25	50 g	1	BCR 334	1.609	20 g	2	VS1-0.70	0.70	50 g
2	VS1-3.56	3.56	50 g	2	VS1-1.49	1.49	50 g	2	VS1-0.55	0.55	50 g
1	BCR 336	3.290	20 g	2	ACIRS S1C	1.46	250 g	2	VS1-0.51	0.51	50 g
2	VS1-3.19	3.19	50 g	1	BCR 333	1.344	20 g	1	BCR 331	0.499	20 g
2	VS1-2.89	2.89	50 g	2	VS1-1.11	1.11	50 g	2	ACIRS S1A	0.42	250 g
2	VS1-2.60	2.60	50 g	1	IARM HC20100B	1.00	50g, last	2	VS1-0.40	0.40	50 g

RM COAL

typical analysis listed in mass %

50 g units

Number	S	DRY ANALYSIS C	ANALYSIS Heat BTU/lb	Ash	Volatiles Matter	Al ₂ O ₃	CaO	IGNITED ANALYSIS Fe ₂ O ₃	K ₂ O	MgO	MnO ₂	Na ₂ O	P ₂ O ₅	SO ₃	SiO ₂	TiO ₂
VS6-056	3.23	(51.61)	(13,719)	8.12	40.30	20.72	4.15	23.92	1.62	0.72	0.04	0.47	0.43	4.19	41.79	1.01
VS6-046	1.82	(70.69)	(14,004)	10.32	19.00	20.17	1.66	14.79	2.21	0.78	0.02	0.27	0.37	1.36	48.08	1.23
VS6-006	1.60	(50.98)	(12,302)	16.98	31.97	24.27	1.07	10.01	1.96	0.76	0.04	0.15	0.16	1.03	56.34	1.81
VS6-016	1.41	(47.64)	(12,293)	16.71	35.59	27.07	0.81	7.96	3.56	1.18	0.02	0.38	0.12	0.77	55.62	1.20
VS6-036	0.65	(76.70)	(14,994)	4.88	18.58	20.73	12.36	15.22	1.51	1.94	0.07	0.46	0.10	11.52	33.39	1.16
VS6-066	0.61	(58.57)	(13,811)	9.27	32.17	26.62	1.03	3.06	2.57	0.84	0.01	0.33	0.08	1.20	60.19	1.62

CRM COAL

analysis listed in mass %

(T) = Total

SARM 20 also contains Ta: 0.00012, Y: 0.0029

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	Mn	Na ₂ O	P	P ₂ O ₅	S	SiO ₂	Sr	TiO ₂	Zr	LOI	Units
SARM 20	11.27	1.87	1.17	0.14	0.43	0.0080	0.27	.	0.14	0.51	17.66	0.0330	0.63	(0.0180)	64.66	120 g
SARM 19	8.01	1.39	1.75	0.24	0.20	0.0157	0.29	0.0130	.	1.49	15.00	0.0126	0.341	0.0351	71.28	120 g
SARM 18	2.57	0.18	0.29	0.145	0.11	0.0022	.	0.0030	.	0.56	6.20	0.0044	0.114	0.0067	90.11	120 g
US CLB-1	(1.51)	0.22	1.25(T)	0.0760	0.0470	(0.0008)	0.0230	.	(0.0700)	(1.49)	(2.51)	.	(0.0780)	.	.	50 g

analysis listed in mg/kg

US CLB-1 also contains informational Ash, Li, Mo, Nb, Nd and Sb

Number	As	Ba	Be	Ce	Co	Cr	Cs	Cu	Ga	Ge	Hf	Hg	La	Ni	Pb	Rb	Sc	Se	Sm	Th	U	V	Zn
SARM 20	4.7	372	2.5	87	8.3	(67)	(2)	18	16	.	4.8	0.25	43	25	26	10	10	0.8	6.3	18	4	47	17
SARM 19	7	304	2.8	56	5.6	50	1.4	13	14	13	5.4	(0.2)	27	16	20	9	7.6	.	4.9	12	5	35	12
SARM 18	.	78	4.1	22	6.7	16	(1)	5.9	(8)	(8)	1.7	(0.04)	10	10.8	(5)	8.1	4.3	.	2.0	3.4	1.5	23	5.5
US CLB-1	(13)	34	.	10	7.0	9.7	.	(10)	(3)	.	.	(0.2)	(5)	18	5.1	5.2	2.0	(2)	.	(1.4)	(0.55)	12	48

CRM COAL

analysis in mass %

* SRM 1635a also contains Ca: 1.087%

50g units

analysis in mg/kg

Number	Ash	Volatiles	BTU	C	Al	Cl	Fe	H	K	N	Na	S	Hg	Mn	V	Zn
SRM 2684C	(7.945)	(39.40)	(13,851)	(76.82)	(0.8730)	(0.0975)	.	(5.17)	(0.0981)	(1.395)	(0.0606)	3.027	0.0688	(20.51)	(16.3)	.
SRM 1632d	(7.078)	(36.04)	(13,821)	(76.88)	(0.912)	0.1142	0.749	5.10	0.1094	(1.59)	0.02969	1.462	0.0928	(13.1)	23.74	(12.9)
SRM 1635a *	(6.29)	(44.75)	(11,664)	(68.97)	0.5437	(0.0051)	0.2472	3.92	0.01874	(0.946)	0.1031	(0.294)	0.0836	6.69	13.34	7.3

analysis in mg/kg # SRM 1635a also contains in mg/kg B: 36, Cs: 0.0998, Eu: 0.1115, Hf: 3.14, Mg: 2303, Mo: 6.36, Sc: 1.24, and Sm: 0.483

Number	As	Ba	Br	Cd	Ce	Co	Cr	Cu	F	Ni	Pb	Rb	Sb	Se	Sr	Th	Ti	U
SRM 2684C	.	.	(11.1)	.	Ca: (3220)	.	.	.	(64)	Mg: (494)	.	.	.	(1.08)	.	.	.	.
SRM 1632d	(6.1)	40.42	.	(0.08)	(11.7)	3.424	(13.7)	5.83	(63.6)	(10)	3.845	7.36	0.445	(1.29)	63.5	1.428	477	0.517
SRM 1635a *	0.860	357.8	(1)	0.282	5.45	2.004	3.56	11.42	(63)	5.37	2.85	1.226	0.251	0.662	160	1.299	254	0.4792

CRM COAL

analysis listed in mass % except * which is mg/kg

powder 50 g

Number	Al%	Ca%	Cd*	Co*	Cr*	Cu*	Fe%	K%	Mg%	Mn%	Na%	Ni*	P%	Pb%	Si%	Ti%	V*	Zn%
NCS FC28127	3.47	1.88	2	9	23	23	1.02	0.29	0.28	0.019	0.052	16	0.010	.	5.61	0.18	60	0.0040
NCS FC28125	2.27	0.28	(<1)	11	5	17	0.24	0.090	0.050	0.0099	0.048	18	0.013	0.0016	2.69	0.090	33	.
NCS FC28123	1.88	0.74	(<1)	4	10	12	0.35	0.026	0.081	0.0030	0.11	8	0.066	0.0016	1.86	0.096	12	(0.001)
NCS FC28124	1.75	0.79	(<1)	4	7	12	0.34	0.020	0.071	0.0016	0.13	8	0.044	0.0016	1.77	0.079	11	.
NCS FC28128	1.22	0.19	.	4	8	12	0.86	0.043	0.059	0.0026	0.026	5	0.0044	.	1.64	0.059	28	(<0.001)
NCS FC28126	0.83	0.65	(<1)	3	5	8	0.32	0.010	0.060	0.008	0.034	8	0.019	.	1.01	0.046	11	.
NCS FC28122	0.25	0.85	.	8	2	2	1.79	0.016	0.24	0.022	0.081	8	0.0029	0.002	0.47	0.010	1	.

CRM COAL

BCR: 40 g units GBW: 50 g units

Number	As mg/kg	P mass %	Cl mass %	F mg/kg
GBW 11115	15	0.031	.	.
GBW 11116	34	0.007	.	.
GBW 11117	51	0.092	.	.
GBW 11118	.	.	0.010	.
GBW 11119	.	.	0.057	.
GBW 11120	.	.	0.110	.
GBW 11121	.	.	.	248
GBW 11122	.	.	.	864
GBW 11123	.	.	.	1496
BCR 460	.	.	(0.0059)	225

CRM COAL AIR DRIED vs. HEATED DRIED ANALYSIS

20 g powder

Number	Heat J/g	Volatile Matter%	Ash%	Moisture%	S%	Expiry
NCS FC62001	26560, 27660	26.95, 28.06	13.42, 13.97	3.96 (air dried)	0.62, 0.65	August 2014 (sale price)
NCS FC62002a	24190, 24980	4.29, 4.43	23.90, 24.68	3.15 (air dried)	0.36, 0.37	August 2019
NCS FC62001c	22840, 25680	28.37, 31.90	11.30, 12.71	11.06 (air dried)	0.63, 0.71	May 2018 H: (3.32%)

CRM FUSIBILITY OF COAL ASH

analysis listed in 'C' MRed = Mildly Reducing, Oxi = Oxidizing, SRed = Strongly Reducing

Atmosphere Number	Initial MRed	Deformation Oxi	Softening SRed	Softening MRed	Softening Oxi	Softening SRed	Hemishpering MRed	Hemishpering Oxi	Hemishpering SRed	Fluid MRed	Fluid Oxi	Fluid SRed	Units
NCS FS91001d	1057,	1176,	1208	1072,	1202,	1253	1098,	1236,	1328	1148,	1320,	1401	30 g
NCS FS28001	1161,	1211,	.	1190,	1230,	.	1198,	1239,	.	1204,	1252,	.	5 g
NCS FS28002	1217,	1356,	.	1340,	1408,	.	1357,	1420,	.	1369,	1445,	.	5 g
NCS FS28003	1285,	1314,	.	1314,	1345,	.	1322,	1360,	.	1340,	1381,	.	5 g

COAL ASH

= class, where 1 = CRM and 2 = RM

analysis listed in mass %

#	Number	SiO ₂	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	Mn	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	V ₂ O ₅	Units	Other
2	COCO ASH002	57.06	19.54	3.22	12.82	0.71	1.82	MnO ₂ : 0.09	0.08	0.11	3.27	1.25	.	10 g	(last) or 20 g (OK)
1	NCS FC28154	53.17	32.02	2.28	6.47	1.37	0.90	MnO: 0.035	0.41	0.19	0.78	1.34	0.027	5 g	
2	ASRM 010-2	52.2	27.1	3.47	10.8	0.92	1.40	Mn ₃ O ₄ : 0.16	0.47	1.13	0.21	1.34	.	100 g	BaO: 0.14 SrO: 0.11 last
1	JCFA-1 *	50.56	24.25	8.91	4.22	1.27	2.12	MnO: 0.068	2.24	0.586	.	1.31	.	100 g	
2	COCO ASH 005	51.00	28.14	3.70	7.20	1.38	1.14	MnO ₂ : 0.04	0.56	0.49	3.52	1.52	.	20 g	
2	COCO ASH 004	50.92	29.76	5.00	5.14	1.23	1.55	MnO ₂ : 0.03	0.11	0.40	3.00	1.80	.	20 g	
2	COCO ASH 003	49.21	28.05	3.02	10.17	1.75	0.97	MnO ₂ : 0.08	0.74	0.40	3.45	1.55	.	20 g	
1	NCS FC28148	48.03	35.80	3.27	2.81	0.90	0.69	MnO: 0.0073	0.54	0.25	.	1.25	0.049	5 g	
1	NCS FC28150	47.64	26.03	10.44	5.79	1.41	1.87	MnO: 0.097	0.28	0.091	.	1.21	0.042	5 g	
1	NCS FC82012	46.77	14.96	21.37	5.51	1.41	1.73		1.36	0.50	3.94	0.63	.	30 g	last of stock
1	NCS FC28151	43.42	28.53	3.33	15.18	0.64	1.21	MnO: 0.042	0.43	0.12	.	1.22	0.062	5 g	
1	NCS FC28146	37.86	33.71	9.90	4.74	0.30	1.27	MnO: 0.037	1.45	1.44	.	1.52	0.020	5 g	
1	NCS FC28147	37.52	32.78	10.97	4.81	0.24	1.17	MnO: 0.020	1.75	1.00	.	1.31	0.019	5 g	
1	NCS FC28149	35.54	25.92	14.92	7.56	0.20	1.63	MnO: 0.17	0.75	0.72	.	1.26	0.032	5 g	
1	NCS FC82017	31.24	10.00	42.40	8.16	1.28	1.17		0.46	0.04	2.76	0.56	.	30 g	last of stock
1	NCS FC28145	15.66	7.34	18.37	39.61	0.30	6.05	MnO: 0.44	1.69	0.10	.	0.26	0.0042	5 g	

* JCFA-1 also contains (in mg/kg) Be: 4.06, Co: 37.4, Cr: 75, Cs: 8.6, Cu: 122, Li: 91, Ni: 32.2, Pb: 47.2, Rb: 54.1, S: 1960, Sb: 2.1, V: 243, and Zn: 63.

* JCFA-1 also contains (in mass %): FeO: 0.88, TFe₂O₃: 5.2, C: 1.35, H₂O-: 0.18, H₂O+: 0.37, Sr: 0.110**CRM COAL ASH**

analysis listed in mass %

100 g units

Number	Al ₂ O ₃	Ba	CaO	CO ₂	Org.C	FeO	T.Fe ₂ O ₃	H ₂ O	H ₂ O+	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	S	SO ₃	SiO ₂	TiO ₂	LOI
VS 7177-95	27.07	0.028	4.88	.	.	1.59	5.48	(0.13)	.	0.59	1.48	0.059	0.14	(0.064)	.	(0.018)	58.68	0.60	(0.56)
VS 9237-2008	9.7	0.86	43.8	(2.9)	.	(0.3)	5.1	.	.	0.36	5.5	0.22	0.67	(0.024)	3.48	.	15.6	0.59	8.5
VS 7125-94	6.79	0.225	20.91	13.20	(1.33)	0.40	6.28	(2.41)	(5.74)	0.51	6.70	0.094	0.22	0.059	0.17	(0.40)	35.80	0.35	(21.29)

continued analysis listed in mg/kg except % which is mass %

Number	Ag	As	Au	B%	Be	Bi	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	F%	Ga	Gd	Ge	Hf	Hg	Ho	La
VS 7177-95	(0.15)	.	.	(0.044)	11	(2.1)	138	25	99	(3.3)	176	.	.	(2.6)	(0.017)	(21)	.	(2.7)	(13)	.	.	70
VS 9237-2008	(0.2)	(8.0)	.	.	2.9	.	37	26	42	(1.2)	51	(2.7)	(1.4)	(0.8)	.	15	(3.3)	(6)	3.3	(0.1)	(14)	20
VS 7125-94	0.16	(1.0)	(0.003)	0.0097	2.9	.	38	16	45	(1.1)	45	(3.8)	(2.4)	0.9	(0.0230)	9	(4.2)	2.3	2.6	(0.03)	(0.87)	20

Number	Li	Lu	Mo	Nb	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Sm	Sn	Sr%	Ta	Tb	Th	Tl	Tm	U	V	W	Y	Yb	Zn	Zr%
VS 7177-95	96	.	7.4	34	.	66	35	.	22	.	27	(15)	11	0.0403	.	.	(45)	.	.	(15)	145	(3.7)	87	7.8	77	0.033
VS 9237-2008	(9)	0.26	(3.0)	7.8	17	68	22	(4.2)	13	3.0	8.6	3.2	(3.2)	0.83	(0.61)	0.45	7.0	(0.4)	(0.25)	3.1	63	.	15	1.5	76	0.013
VS 7125-94	32	0.40	1.4	8.4	20	49	13	(4.3)	15	.	11	4.1	2.7	0.33	(0.53)	0.68	5.8	.	(0.38)	3.3	61	(1.1)	29	2.6	65	0.0119

CRM COAL ASH

Number	Ash%	C%	S%	Units
CZ SFA-01-14	96.60	3.10	0.029	50 g

CRM COAL WASTE ROCK analysis listed in mass % 50 g units

Number	Al	Ca	Fe	K	Mg	Mn	Na	P	Si	Ti	V
NCS FC28152	10.76	0.34	2.57	1.27	0.53	0.023	0.15	0.026	20.59	0.44	0.012

CRM ASH OF COAL WASTE ROCK analysis in mass % 5 g units

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SiO ₂	TiO ₂	V ₂ O ₅
NCS FC28153	27.71	0.65	5.01	2.09	1.20	0.041	0.27	0.082	60.03	1.01	0.028

CRM COAL FLY ASH analysis listed in mass %

Number	As	Al	Ba	Ca	Fe	K	Mg	Mn	Na	Ni	P	S	Si	Ti	Zn	LOI
IRNT 12-1-01	0.1820	10.8	0.0680	3.42	7.49	1.75	1.17	0.0630	0.551	0.00709	.	.	25.7	0.447	0.0157	.
SRM 2689	(0.0200)	12.94	(0.0800)	2.18	9.32	2.20	0.61	(0.0300)	0.25	(0.0122)	0.10	.	24.06	0.75	(0.0240)	(1.76)
SRM 1633c	0.01862	13.28	0.1126	1.365	10.49	1.773	0.498	0.02402	0.1707	0.0132	(0.192)	(0.110)	(21.30)	0.724	(0.0235)	.
IRNT 12-1-02	0.00739	16.1	0.1090	1.49	5.17	0.651	0.581	0.0441	0.361	0.0105	.	.	22.9	3.61	0.0221	.
BCR 176R	0.0054	.	(0.4650)	.	1.3100	.	.	(0.0730)	(3.4800)	0.0117	.	.	.	.	1.6800	.
IRNT 12-1-03	0.00505	14.7	0.0731	1.86	5.59	1.36	0.788	0.0383	0.303	0.0117	.	.	25.0	1.36	0.0248	.
BCR 038	0.00480	.	.	.	3.3800	.	.	0.0479	3.740	(0.0194)	.	.	.	.	0.0581	.
SRM 2691	(0.0030)	9.81	(0.5900)	18.45	4.42	0.34	3.12	(0.0200)	1.09	(0.0053)	0.51	0.83	16.83	0.90	(0.0120)	(0.23)
SRM 2690	(0.0026)	12.35	(0.5800)	5.71	3.57	1.04	1.53	(0.0300)	0.24	(0.0046)	0.52	0.15	25.85	0.52	(0.0120)	(0.53)

continued analysis listed in mg/kg except % which is mass %

Number	Ag	Au	B	Be	Br	Cd	Ce	Co	Cr	Cs	Cu	Eu	F	Hf	Hg	La
IRNT 12-1-01	.	.	291	4.30	.	.	98.7	25.7	96.8	118	58.7	.	.	.	0.00706	.
SRM 2689	.	.	(21)	.	(3)	.	.	(48)	(170)	(11)	.	(3)	.	(7)	(<0.003)	.
SRM 1633c	.	.	(16)	.	0.758	(180)	42.9	(258)	(9.39)	173.7	(4.67)	.	.	.	1.005	(87.0)
IRNT 12-1-02	.	.	.	.	.	322	52.4	189	20.1	231	4.99	.	.	.	164	.
BCR 176R	(33.1)	(0.604)	.	(836)	226	(47.7)	26.7	810	(8.27)	1050	(0.868)	.	(4.85)	(1.60)	(30.2)	.
IRNT 12-1-03	.	.	.	.	.	183	48.6	191	.	155	.	.	.	.	84.4	.
BCR 038	.	.	.	.	4.6	.	53.8	(178)	.	176	.	.	.	.	.	.
SRM 2691	.	.	(8)	.	(0.9)	.	(26)	(68)	(1)	.	(2)	.	(10)	(<0.003)	.	.
SRM 2690	.	.	(8)	.	(0.7)	.	(19)	(67)	(8)	.	(2)	.	(8)	(<0.003)	.	.

Number	Pb	Rb	Sb	Sc	Se	Sr	Ta	Th	Tl	U	V	W	Yb	Units
IRNT 12-1-01	43.1	150	5.28	20.4	.	275	.	.	.	.	195	.	3.49	50 g
SRM 2689	(52)	.	(9)	(32)	(7)	(700)	.	(25)	.	.	.	.	.	3 x 10 g
SRM 1633c	95.2	117.42	8.56	(37.6)	(13.9)	901	(1.58)	(23.0)	.	(9.25)	286.2	.	(7.7)	75 g
IRNT 12-1-02	40.8	69.0	.	.	.	583	.	23.9	.	.	558	.	.	50 g
BCR 176R	5000	(102)	850	(2.91)	18.3	.	(2.02)	(5.28)	1.32	.	(35)	(28.3)	.	40 g
IRNT 12-1-03	66.9	141	.	29.2	.	407	.	22.1	.	.	381	.	.	50 g
BCR 038	262	.	(3)	(24)	(17)	(2700)	.	(26)	.	.	.	.	.	5 to 6 g
SRM 2691	(29)	.	(6)	(17)	(0.8)	(2000)	.	(25)	.	.	.	.	.	3 x 10 g
SRM 2690	(39)	.	.	.	.	.	.	.	.	.	.	.	.	3 x 10 g

CRM COAL FLY ASH analysis listed in mass % 30 g units

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	P ₂ O ₅	SiO ₂	SO ₃	TiO ₂
NCS FC82016a	34.20	4.73	4.89	0.86	0.76	0.42	0.25	51.24	0.43	1.26
NCS FC82012a	29.45	8.73	7.95	1.16	1.03	0.79	0.28	46.99	0.69	1.28
NCS FC82013a	28.54	5.30	13.43	1.61	0.71	0.25	0.11	41.11	5.10	2.62
NCS FC82014a	28.09	5.15	6.04	1.44	1.05	0.52	0.38	54.68	0.49	1.14
NCS FC82015a	22.90	4.01	6.55	1.53	1.31	0.78	0.55	59.66	0.40	1.13
NCS FC82017a	10.40	39.62	7.17	0.78	3.71	0.83	0.04	25.60	9.04	0.48

INDUSTRIAL FLY ASH

analysis listed in mass % except * which is mg/kg

Number	Al	As	Ca	Cd	Cr	Hg*	Na	Ni	Pb	Cu	Fe	K	Sb	V	Zn	ZnO
ECRM 882-1	0.375	0.0054	10.11	0.0183	0.490	0.75	0.697	0.0263	1.324	0.218	22.20	0.960	0.0116	0.0090	.	28.49
JK 43	(0.2)	.	(12)	0.0023	(8)	3.9	(0.5)	(2)	0.21	(0.2)	(20)	(0.3)	.	(0.02)	4.96	.
JK 44	(0.2)	.	(5)	0.0469	(0.2)	2.8	(1)	(0.02)	2.74	(0.2)	(27)	(1.3)	.	(0.02)	27.3	.
JK 45	(0.1)	.	(7)	0.0047	(0.3)	0.25	(7)	(0.05)	0.11	(0.01)	(40)	(0.4)	.	(0.1)	1.53	.
502-843-1000	.	.	.	.	.	0.827	.	.	.	.	.	.	.	.	.	.

Number	Bi	C	Cl	F	Mg	Mn	S	Si	Sn	Units, Class
ECRM 882-1	0.0026	(1.0)	(2.35)	(0.07)	(0.48)	(2)	(0.5)	(1.05)	(0.02)	100 g, CRM
JK 43	.	.	.	.	.	.	.	.	.	15 g, CRM
JK 44	.	.	.	.	.	.	.	.	.	25 g, CRM
JK 45	.	.	.	.	.	.	.	.	.	15 g, CRM
502-843-1000	.	42.4	.	.	.	.	0.29	.	.	20 g, RM

RM

COAL-TAR PITCH

analysis listed in mg/kg except as noted

60 g units

Number	%C	S%	%H	Ash	Al	As	Br	Ca	Cd	Cl	Cr	Fe	I	K	Mg	Mn	Na	Ni	P	Pb
DOMTAR CTP A	94.0	0.49	4.0	0.27	245	.	1.7	91	.	118	0.87	200	0.33	43	17	2.7	257	2.5	10	91
DOMTAR CTP B	93.4	0.52	4.3	0.22	228	9	4.8	41	2.5	122	1.1	280	0.6	34	<30	3.3	150	.	3	80
DOMTAR CTP D	92.7	0.58	4.8	0.04	1.2	2.2	0.08	1.4	<0.5	1.3	2.2	4	0.84	0.6	<2	0.030	9	.	1	0.6
DOMTAR CTP C	83.4	4.46	10.31	0.19	9	0.18	0.25	3	<0.05	18	0.4	14	1.4	2.2	<16	0.21	10	76	236	1

continued informational values listed in mg/kg except as noted

Number	Sb	Si	Sn	Ti	V	Zn	Soft Point 'C
DOMTAR CTP A	.	358	.	18	1.2	88	115
DOMTAR CTP B	0.57	408	3.7	16	0.89	90	118
DOMTAR CTP D	0.014	10	<0.2	0.32	0.06	1	86.5
DOMTAR CTP C	0.03	20	<0.7	19	170	1	129

CRM COATING THICKNESS

Number nominal μ m coating thickness

SRM 1361b	6	12	25	48
SRM 1358b	20	80	255	1000
SRM 1362b	40	80	140	205
SRM 1359b	48	140	505	800
SRM 1363b	255	385	505	635
SRM 1364b	800	1000	1525	1935

These samples are designed for calibrating thickness gauges using magnetic principles. Each sample is a set of four 45 mm x 45 mm plates of coated 1010 sheet steel substrate coated with copper and a thin protective layer of chromium.

CONTINUOUS CASTING POWDER

analysis listed in mass %

IRSID: RM, 100 g units NCS: CRM, 50 g units

Number	SiO ₂	Al ₂ O ₃	C	C.Free	CO ₂	Ca	F	Fe	K	MgO	Mn	Na	Na ₂ O	P	S	TiO ₂	LOI
NCS HC26805	41.31	6.93	3.06	1.57	.	21.46	(4.79)	.	.	3.26	.	.	4.07	.	.	.	.
NCS HC26804	34.95	5.30	15.86	14.49	.	19.13	(5.15)	.	.	0.78	.	.	4.99	.	.	.	.
IRSID 2701	32.70	6.10	3.37	(1.78)	(5.59)	22.90	7.58	(0.145)	0.159	2.19	.	9.42	.	(0.014)	(0.055)	(0.048)	(2.08)
NCS HC26803	30.10	2.14	5.98	4.06	.	30.78	(10.59)	.	.	1.30	.	.	0.52	.	.	.	.
IRSID 2702	28.70	12.60	16.54	15.80	(2.53)	17.80	6.08	1.260	(0.750)	(1.47)	0.071	3.61	.	(0.180)	(0.490)	0.564	(1.26)
NCS HC26802	23.08	14.14	12.71	9.94	.	17.93	(3.86)	.	.	5.86	.	.	2.94	.	.	.	.
NCS HC26801	18.96	16.99	19.97	18.14	.	12.89	(4.47)	.	.	1.39	.	.	9.86	.	.	.	.

RM

CONTINUOUS CASTING POWDER

typical analysis listed in mass %

100 g units

Number	SiO ₂	Al ₂ O ₃	Ca	F	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	S	SrO	TiO ₂	Other
DH X2802	57.50	3.09	25.15	0.074	0.488	0.830	0.981	0.030	1.097	0.060	0.132	0.020	0.055	ZnO: 0.004
DH X2801	55.0	3.58	23.08	0.047	0.467	1.092	4.80	0.033	1.33	0.044	0.245	0.019	0.069	BaO: 0.019
DH 3011	43.23	4.40	26.58	5.59	2.122	0.606	5.85	0.033	2.23	0.106	0.058	0.029	0.178	Y: 0.028
DH 3005	43.10	5.14	27.35	6.23	0.233	0.376	0.39	0.007	7.93	0.091	0.019	.	0.086	
DH 3010	38.56	5.05	27.06	.	2.63	0.155	4.13	0.059	5.479	0.454	0.131	.	0.055	
DH 3013	37.70	5.95	30.73	5.72	0.437	0.288	1.93	0.045	6.43	0.047	0.077	.	0.064	BaO: 0.121

RM

COVER POWDER

analysis listed in mass %

100 g units

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	Mn ₃ O ₄	Na ₂ O	P ₂ O ₅	S	SiO ₂	SrO	TiO ₂
DH 5905	19.32	46.50	0.435	0.321	9.17	0.051	.	0.039	0.074	22.93	.	0.035
DH 5906	14.34	33.29	0.598	0.210	19.38	0.052	0.32	0.037	0.061	30.78	0.015	0.037

COKE

= class, where 1 = CRM and 2 = RM i = individually certified

#	Number		S	Heat	Vol.Matter	Ash	C	H	N	Sp.Gravity	Moisture	Units
1	IARM HP-40700A	Green Petroleum	6.7	(15,000) BTU	10.7	0.34	.	.	.	.	(0.9)	50 g
1	502-684-13284a		5.60	(15,307) BTU	13.2	0.33	87.7	3.84	1.51	.	.	50 g
1	SRM 2718	Green Petroleum	4.7030	(35,760) J/g	(10.6)	(0.18)	(88.99)	(3.47)	(1.23)	.	.	50 g
2	VS2-022	Petroleum	1.7-2.0i	.	.	.	.	.	.	.	.	70 g
1	NCS FC28015		1.69	.	2.11	7.04	.	.	.	.	.	75 g
1	NCS FC28014		1.55	.	3.47	27.15	.	.	.	.	.	75 g
1	VS R18/4		1.34	.	.	12.45	.	.	.	.	.	70 g
1	NCS FC28134		1.19	29,040 J/g	1.95	12.70	.	.	.	.	.	50 g
1	NCS FC28133		1.00	29,180 J/g	1.79	12.30	.	.	.	.	.	50 g
1	SRM 2719	Calcined Petroleum	0.8877	(32,900) J/g	(0.54)	(0.12)	(97.06)	(0.16)	(1.17)	.	.	50 g
1	NCS FC28118a		0.87	29,100 J/g	2.05	12.01	.	.	.	.	.	50 g
1	SRM 2776	Furnace	0.825	.	(0.98)	(8.06)	(89.15)	(0.26)	(1.21)	.	.	50 g
1	NCS FC28119		0.81	28,300 J/g	1.34	14.43	.	.	.	.	.	50 g
1	NCS FC28121		0.75	28,760 J/g	1.14	13.29	.	.	.	.	.	50 g
2	502-683-14214		0.75	(12,719) BTU	1.75	9.89	88.4	(0.20)	1.07	.	.	50 g
2	VS2-002	Petroleum	0.70-0.90i	.	.	.	.	.	.	.	.	70 g
1	NCS FC28120a		0.68	28,540 J/g	1.48	13.51	.	.	.	.	.	50 g
1	NCS FC59001		0.63	.	1.39	7.22	.	.	.	.	.	60 g
1	NCS FC28117a		0.60	28,190 J/g	1.62	15.15	.	.	.	.	.	50 g
1	SRM 2775	Foundry	0.5816	.	(1.31)	(5.77)	(91.34)	(0.41)	(1.16)	.	.	50 g
1	NCS FC28132a		0.50	29,160 J/g	1.40	12.26	.	.	.	.	.	50 g
1	NCS FC59002		0.47	.	1.5	12.62	.	.	.	.	.	60 g
1	CZ SF-05-14		0.45	30,410 J/g	1.28	7.84	90.40	0.20	0.98	13,074 BTU/lb	.	50 g
1	ASCRM 014		0.314	28,260 J/g	1.04	12.23	85.65	0.32	0.82	1.87	.	250 g

Number	Al	Fixed C	Ca	Co	Fe	K ₂ O	Na	Na ₂ O	Ni	P	Si	V
IARM HP-40700A	.	.	0.003	.	0.0074	.	0.005	.	0.031	.	0.004	0.15
502-684-13284a	.	(86.5)	.	.	.	.	.	.	.	.	.	17025
SRM 2718	0.00165	.	0.0174	(0.000579)	0.0290	.	(0.00886)	.	0.01391	.	(0.006300)	0.0302
VS2-022	.	.	.	.	.	.	.	.	.	.	.	.
NCS FC28015	.	.	.	.	.	.	.	.	.	.	.	.
NCS FC28014	.	.	.	.	.	.	.	.	.	.	.	.
VS R18/4	.	.	.	.	.	0.128	.	0.051	.	0.037	.	.
NCS FC28134	.	.	.	.	.	.	.	.	.	0.024	.	.
NCS FC28133	.	.	.	.	.	.	.	.	.	0.024	.	.
SRM 2719	0.00589	.	0.00577	(0.00186)	0.02016	.	(0.00151)	.	0.0204	.	(0.01380)	0.00586
NCS FC28118a	.	.	.	.	.	.	.	.	.	0.022	.	.
SRM 2776	.	.	.	.	.	.	.	.	.	.	.	.
NCS FC28119	.	.	.	.	.	.	.	.	.	.	.	.
NCS FC28121	.	.	.	.	.	.	.	.	.	.	.	.
502-684-14214	.	(88.4)	.	.	.	.	.	.	.	.	.	.
VS2-002	.	.	.	.	.	.	.	.	.	.	.	.
NCS FC28120a	.	.	.	.	.	.	.	.	.	0.022	.	.
NCS FC59001	.	.	.	.	.	.	.	.	.	.	.	.
NCS FC28117a	.	.	.	.	.	.	.	.	.	.	.	.
SRM 2775	.	.	.	.	.	.	.	.	.	.	.	.
NCS FC28132a	.	.	.	.	.	.	.	.	.	0.030	.	.
NCS FC59002	.	.	.	.	.	.	.	.	.	.	.	.
CZ SF-05-14	.	.	.	.	.	.	.	.	.	.	.	.
ASCRM 014	.	.	.	.	.	.	.	.	.	0.09	.	.

CRM COKE

analysis listed in mass % unless otherwise noted

50 g units

Number	S	P	Heat J/g	Vol.Matter	ASH	Al ₂ O ₃	As	CaO	Cl	Cr	Cu
NCS FC28023	1.44	0.018	27,560	1.80	16.20	5.28	0.00024	0.57	0.022	0.0021	0.0018
NCS FC28027	0.89	0.026	28,120	1.65	14.83	.	.	.	.	.	.
NCS FC28022	0.81	0.018	29,100	1.68	11.90	3.98	0.0002	0.55	0.049	0.0022	0.002
NCS FC28026	0.79	0.031	28,950	1.36	12.18	.	.	.	.	.	.
NCS FC28020	0.76	0.037	28,260	1.78	14.42	4.95	0.00014	0.52	0.020	0.0022	0.0027
NCS FC28019	0.67	0.027	29,080	1.31	11.64	4.17	0.0001	0.45	0.024	0.0015	0.0018
NCS FC28019a	0.67	0.027	28,950	1.42	11.62	4.08	0.00012	0.45	0.026	0.0017	0.0019
NCS FC28025	0.62	0.021	29,320	1.45	11.50	.	.	.	.	.	.
NCS FC28024	0.41	0.041	28,170	1.98	15.43	.	.	.	.	.	.

Number	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	Ni	Pb	SiO ₂	SrO	TiO ₂	V
NCS FC28023	0.96	0.11	0.097	0.0044	0.067	0.001	0.0008	8.17	0.0084	0.20	0.0037
NCS FC28027	.	.	.	.	.	.	.	.	.	.	.
NCS FC28022	0.63	0.069	0.16	0.013	0.084	0.0008	0.0008	5.63	0.011	0.18	0.0032
NCS FC28026	.	.	.	.	.	.	.	.	.	.	.
NCS FC28020	1.22	0.079	0.15	0.0052	0.05	0.0008	0.0011	6.52	0.017	0.22	0.0038
NCS FC28019	0.55	0.058	0.094	0.0049	0.08	0.001	0.0009	5.52	0.01	0.18	0.0027
NCS FC28019a	0.58	0.057	(0.10)	0.0055	0.078	0.0009	0.0007	5.48	0.0095	0.18	0.0028
NCS FC28025	.	.	.	.	.	.	.	.	.	.	.
NCS FC28024	.	.	.	.	.	.	.	.	.	.	.

last of stock

CRM COKE

analysis listed in mass % except * which is mg/kg

Number	Al%	Ca%	Cd*	Co*	Cr*	Cu*	Fe%	K%	Mg%	Mn%	Na%	Ni*	P%	Pb*	Si%	Ti%	V*	Zn*
NCS FC28131	2.72	0.29	<1	7	11	16	0.51	0.094	0.046	0.008	0.050	13	0.015	.	3.22	0.12	27	18
NCS FC28129	2.34	0.60	.	7	15	21	0.75	0.093	0.11	0.021	0.13	15	0.020	14	2.97	0.12	41	11
NCS FC28130	1.96	0.52	<1	6	12	17	0.63	0.061	0.11	0.015	0.063	12	0.022	.	2.35	0.099	34	11

COKE ASH

analysis listed in mass %

Number	Al ₂ O ₃	CaO	Co ₃ O ₄	Fe	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	SiO ₂	SrO	TiO ₂	V ₂ O ₅	LOI
NCS FC28137	35.62	2.82	.	.	5.02	0.78	0.53	0.070	0.47	0.24	.	47.81	.	1.38	0.033	.
NCS FC28136	30.66	6.00	.	.	7.51	0.61	1.50	0.16	0.70	0.41	.	41.61	.	1.37	0.050	.
NCS FC28135	29.95	5.67	.	.	7.23	0.76	1.25	0.18	1.18	0.31	.	42.87	.	1.41	0.049	.
DH 3711	13.79	11.60	0.007	7.79	.	3.29	8.69	0.189	3.08	0.607	0.091	43.5	0.103	2.78	0.058	0.52

Number	C.tot	CO ₂	Cr ₂ O ₃	CuO	NiO	ZnO	ZrO ₂	Units
NCS FC28137	.	.	.	.	.	.	.	CRM, 5 g
NCS FC28136	.	.	.	.	.	.	.	CRM, 5 g
NCS FC28135	.	.	.	.	.	.	.	CRM, 5 g
DH 3711	0.039	0.045	0.036	0.009	0.030	0.010	0.041	RM, 100 g

CRM DUST

Number	Type	Al	Al ₂ O ₃	As	C	CaO	Co	Cr	Cr ₂ O ₃	Cu	CuO	F	Fe	FeO	K
VS E5	Blast Furnace	.	2.87	.	13	7.9	0.013	.	0.085	.	0.013	0.049	44.3	.	.
VS E4	Blast Furnace	.	2.33	0.0018	13.2	8.8	.	.	.	.	0.034	0.023	44.6	.	.
VS E2	Converter	(0.07)	.	(0.002)	1.383	7.97	(0.003)	(0.1)	.	(0.04)	.	(0.5)	56.4	6.2	(0.2)
VS E1	Electric Furnace	.	3.06	(0.004)	0.684	5.85	(0.03)	.	20.3	(0.1)	.	(0.7)	29.7	(21)	(0.1)
VS E3	Open Hearth Furnace	.	0.25	0.0067	0.082	0.69	0.013	.	0.203	.	0.242	.	52.9	.	.

Number	MgO	MnO	Na	Ni	NiO	P	Pb	S	SiO ₂	Sn	TiO ₂	V	V ₂ O ₅	Zn	Units
VS E5	2.26	0.5	.	.	0.022	0.041	.	0.26	7.17	.	1.63	.	0.39	0.27	150 g
VS E4	0.82	0.47	.	.	.	0.033	0.015	0.44	7.46	.	0.2	.	0.041	1.52	150 g
VS E2	1.64	1.41	(0.1)	(0.03)	.	0.065	0.276	0.116	1.76	(<0.0005)	.	(0.01)	.	0.59	100 g
VS E1	9.3	1.56	(0.1)	.	3.68	(0.02)	(0.05)	0.072	10.3	(<0.0005)	2.79	(0.04)	.	(0.2)	150 g
VS E3	1.84	0.86	.	.	0.062	0.083	0.49	2.78	0.43	0.017	.	.	.	4.2	60 g

RM DUST

typical analysis listed in mass %

* samples list Cu as CuO and Ni as NiO

DH 6203-6205: 20 g

all others: 100 g

Number	Type	Al ₂ O ₃	C	CO ₂	CaO	Cl	Cr ₂ O ₃	CuO	K ₂ O	MgO	Na ₂ O	P ₂ O ₅	PbO	SiO ₂	TiO ₂	ZnO
DH X2901	Blast Furnace	0.961	.	.	5.28	.	0.038	.	0.778	1.147	0.119	0.153	0.006	4.28	0.068	0.267
DH X2902	Blast Furnace	0.823	.	.	3.12	.	0.037	.	0.84	0.678	0.138	0.165	0.017	3.28	0.053	0.271
DH X2903	Blast Furnace	0.701	.	.	2.00	.	0.040	0.006	0.705	0.502	0.111	0.158	0.018	2.44	0.058	1.19
DH 6205	Cupola	1.30	6.80	3.84	4.91	2.88	0.041	0.163	3.68	1.85	2.26	0.147	2.43	34.52	0.060	21.01
DH 6204 *	Cupola	1.06	8.08	2.02	2.54	3.62	0.072	0.079	4.16	1.53	2.63	0.051	3.48	26.94	0.184	30.65
DH 6206 *	Cupola	0.220	2.57	.	0.090	.	0.048	2.021	0.086	0.020	0.085	0.191	.	0.430	0.014	91.1
DH 6203	Electric Furnace	2.57	4.22	1.01	1.23	2.00	0.004	0.311	2.51	3.10	5.12	0.52	1.05	15.65	0.517	12.32

continued

Number	F	Fe	Fe ₂ O ₃	Mn	Mn ₃ O ₄	MoO ₃	NiO	S	SO ₃	SnO ₂	V ₂ O ₅	-H ₂ O
DH X2901	.	59.37	.	0.367	.	.	0.015	0.488	.	.	0.020	.
DH X2902	.	61.67	.	0.341	.	.	0.016	0.577	1.44	.	.	.
DH X2903	.	63.01	.	0.425	.	.	0.012	0.392	.	.	0.020	.
DH 6205	0.096	.	9.49	.	2.57	0.013	.	2.70	0.018	0.019	0.107	at 900°C
DH 6204 *	0.247	6.29	0.97	.	0.0162	.	0.109	.	0.055	.	0.055	at 500°C
DH 6206 *	.	.	0.572	0.04	0.061	.	0.297	0.305	.	0.047	1.17	at 900°C
DH 6203	0.570	.	36.85	.	4.97	.	.	5.29	.	0.004	0.214	at 900°C

analysis for DH 6204 continues in mg/kg

Number	Cd	Li	Mo	Sr	V
DH 6204	197	0.4	510	5.4	2.92

CRM FLUE DUST

informational analysis listed in mass %

30 g units

Number	Type	Al ₂ O ₃	CO ₂	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	SO ₃	SiO ₂	TiO ₂
BL 12-1-11	Sinter Plant	4.00	8.60	6.77	3.18	1.23	2.22	0.03	4.11	1.15	65.58	0.23
BL 12-1-10	Foundry	1.64	5.39	12.80	60.95	0.28	7.59	0.16	0.15	2.22	9.80	0.075

continued

certified analysis listed in mg/kg

Number	Ag	As	Ba	Cd	Co	Cr	Cu	Mo	Ni	Pb	Sb	Sn	Sr	V	Zn
BL 12-1-11	.	(8)	160	(3)	8	3910	27	(10)	36	(25)	.	(43)	(58)	56	50
BL 12-1-10	(1)	(8)	(150)	5	31	189	76	(4)	47	56	(3)	(40)	(50)	(33)	86

CRM FURNACE DUST

analysis listed in mass %

100 g units

Number	Ag	Al	As	Bi	C	Ca	Cd	Cl	Co	Cr	Cu	F	Fe	H ₂ O	Hg
ECRM 876-1	.	0.034	0.023	.	.	3.43	.	.	.	0.17	0.42	.	24.85	.	.
ECRM 880-1	.	1.28	.	.	.	3.15	.	0.085	.	0.027	0.005	0.034	31.0	.	.
ECRM 884-1	0.0028	0.379	0.0054	0.0280	(0.82)	5.22	0.0045	0.991	0.0046	1.86	0.1569	0.411	31.67	(0.30)	(0.0002)

continued

Number	K	Mg	Mn	Mo	Na	Ni	P	Pb	S	Si	Sn	Ti	V	Zn	LOI
ECRM 876-1	1.63	1.31	2.84	.	1.98	0.034	0.128	.	0.87	1.72	.	0.048	.	23.29	.
ECRM 880-1	0.108	0.714	0.218	.	0.041	0.014	0.038	0.017	0.425	3.34	.	0.081	.	0.064	.
ECRM 884-1	0.979	1.848	5.85	0.208	0.585	0.197	0.079	0.442	(0.49)	2.100	0.0186	0.0230	0.0303	17.50	(2.94)

CRM INDOOR DUST

analysis listed in mg/kg

8 g units

Number	As	Cd	Cr	Hg	Pb
SRM 2584	17.4	10.0	135.0	5.20	9761
SRM 2583	7.0	7.3	80	1.56	85.9

CRM ROAD DUST

analysis listed in mg/kg

Number	Pd	Pt	Rh	Cd	Co	Hf	Mo	Rb	Sb	Th	V	Y	Units
BCR 723	6.1	813	12.8	(2.5)	(29.8)	(2.2)	(40.0)	(75)	(28.2)	(4.8)	(74.9)	(12.5)	25 g

continued analysis listed in mass %

Number	Al	Ba	Cr	Fe	Mn	Ni	Pb	Sr	Ti	Zn	Moisture
BCR 723	(3.75)	(0.046)	(0.0440)	(3.29)	(0.128)	(0.0171)	(0.0866)	(0.0254)	(0.258)	(0.166)	(~3%)

CRM ELECTRONIC SCRAP MELTED WITH PYRITE

analysis listed in mg/kg except % which is mass %

Number	Ag	Au	Be	Cu%	In	Ni%	Pd	Pt	Units
BAM EZ505	692	292	68.8	15.10	91	0.470	90.5	8.5	powder 200 g

CRM USED AUTOMOBILE EXHAUST CATALYST mg/kg

Number	Pb	+/-	Pd	+/-	Pt	+/-	Rh	+/-	Units
SRM 2557	13931	97	233.2	1.9	1131	11	135.1	1.9	70 g
SRM 2556	6228	49	326.0	1.6	697.4	2.3	512	0.5	70 g

RM ELECTRODE CARBON

Number	Size Analysis	Ash	Bulk Density	Relative Density	Moisture	Volatile Matter	Units
ACIRS EC	<1% @ +212 μ m	2.8%	1028 g/L	2.08	0.2%	0.8%	1 kg

FERROBORON

= class, where 1 = CRM and 2 = RM

NCS: 50 g

all others: 100 g

#	Number	B	Al	C	Cr	Cu	Mn	Ni	P	S	Si	Sn	Ti	V	Zn
1	NCS HC37610	20.99	.	0.41	.	.	.	.	0.018	0.007	0.40	.	.	.	.
1	VS F21/2	20.91	1.546	0.047	.	0.012	.	.	0.0119	.	0.73	0.0055	.	.	0.0055
1	NCS HC25658	20.58	0.99	0.022	.	.	.	.	0.017	0.0016	1.68	.	.	.	.
1	NCS HC28632	19.33	0.185	0.19	0.26	0.050	0.575	0.056	0.027	0.0020	0.65	.	0.030	0.010	.
1	NCS HC28631	18.92	0.036	0.40	0.025	0.015	0.310	0.013	0.025	0.0023	0.18	.	0.017	0.0090	.
1	NCS HC93623	18.69	0.083	0.45	.	.	.	.	0.025	0.0044	0.44	.	.	.	.
1	ECRM 587-1	18.67	0.047	0.738	0.104	.	0.272	.	0.020	.	0.129	.	0.039	0.004	.
1	VS F22/3	8.95	7.78	0.161	.	3.43	.	.	0.021	0.018	7.82	.	.	.	.

FERROCHROMIUM

= class, where 1 = CRM and 2 = RM

chips as noted

all others: powder

#	Number	Cr	Al	C	Co	Cu	Fe	Mn	N	Ni	P	S	Si	Ti	V	Units
1	IRSID 509-1	72.85	.	0.012	.	.	.	.	0.029	.	(0.019)	.	0.230	.	.	100 g
1	ECRM 580-1	72.18	.	0.019	0.047	.	.	.	0.035	.	0.011	.	0.306	.	0.083	100 g
1	VS F11/4	71.41	.	0.119	.	.	27.20	0.161	0.035	0.362	0.023	0.0021	0.68	.	0.084	100 g
1	VS F35/1	71.3	.	0.88	.	.	26.74	.	.	.	.	0.0022	0.37	.	.	100 g
2	DH 1602	71.20	0.017	8.12	Nb:0.006	.	19.38	0.103	W:0.038	0.304	0.014	Mg:0.049	0.153	0.009	0.102	50 g
1	IPT 65	71.2	9.2	0.051	0.016	.	17.9	0.128	.	0.077	0.006	0.016	0.71	.	.	100 g
1	SRM 196	70.83	.	0.035	.	.	.	.	.	0.020	0.003	0.373	.	.	.	100 g
1	IRSID 507-1	70.30	.	5.40	.	.	0.270	0.049	.	0.017	.	1.20	.	.	.	100 g
2	DH 1802	70.28	0.026	1.31	0.050	W:0.021	27.09	0.209	0.073	0.369	0.026	0.004	0.298	Mg:0.015	0.061	50 g
1	NCS HC93610	70.15	.	7.99	.	.	.	0.225	.	.	0.018	0.030	0.26	.	.	50 g
1	VS F47	69.8	.	8.80	.	.	.	0.020	.	0.025	0.036	0.103	.	.	.	100 g
2	DFS 1	69.8	.	0.0549	.	H:(0.0024)	.	0:(0.56)	0.0973	.	(0.027)	(0.0017)	(0.87)	.	.	50 or 100 g
2	DFS 2	69.6	.	9.03	.	.	.	0:(0.2)	(0.0178)	.	(0.021)	(0.0174)	(0.2)	.	.	50 or 100 g
1	NCS HC37618	69.12	.	8.44	.	.	.	.	.	0.026	0.026	0.30	.	.	.	50 g
1	VS F45	69.0	0.041	0.071	.	.	.	0.082	.	0.027	0.0024	1.10	.	.	.	100 g
1	VS F35/2	68.9	.	0.79	.	.	28.16	.	0.185	.	0.027	0.0022	0.181	.	.	100 g
1	VS F46	68.8	.	5.47	.	.	.	.	0.055	.	0.030	0.015	1.05	.	.	100 g
1	NCS HC93604	68.13	.	0.038	.	.	.	0.103	.	0.260	0.022	0.015	0.466	0.016	.	50 g
1	VS F15/2	68.1	0.30	0.080	.	.	.	1.79	.	0.036	0.0019	2.08	.	.	.	100 g
1	SRM 64c	68.00	.	4.68	0.051	0.005	24.98	0.16	0.045	0.43	0.020	0.067	1.22	0.002	0.15	100 g
1	NCS HC25635	67.23	.	0.051	.	.	.	0.311	.	0.30	0.028	(0.003)	1.01	.	.	50 g
1	NCS HC26607b	65.86	.	7.23	.	.	.	0.38	.	0.29	0.017	0.020	2.18	0.15	.	50 g
1	NCS HC25603b	65.27	.	7.37	0.044	.	24.90	0.31	.	0.39	0.020	0.015	1.27	0.104	0.138	50 g
1	NM 303	64.95	.	6.43	.	.	.	.	.	.	.	.	1.77	.	.	100 g
1	NCS HC37607	64.32	.	0.086	.	.	.	0.35	.	.	0.034	0.005	1.39	.	.	40 g
2	DFS 3	64.2	.	(0.068)	.	.	.	0:(3)	9.71	.	(0.023)	(0.016)	(0.54)	.	.	50 or 100 g
1	NCS HC11606	64.17	.	6.37	.	.	.	0.32	.	.	0.023	0.013	4.29	.	.	100 g
1	NCS HC37608	64.06	.	0.243	.	.	.	0.34	.	.	0.039	0.019	0.99	.	.	40 g
1	NCS HC37615	63.50	.	8.78	.	.	.	.	.	.	0.023	0.025	0.78	0.097	.	50 g
1	NCS HC25651	63.31	.	2.55	.	.	.	0.47	.	.	0.023	0.047	2.04	.	.	50 g
1	NCS HC25644	62.57	.	0.0064	.	.	.	.	8.69	.	0.024	0.029	0.75	.	.	50 g
1	NCS HC28621	62.54	.	7.78	.	.	27.09	0.307	.	.	0.026	0.033	1.45	0.166	0.138	50 g
1	NCS HC25653	62.49	.	8.70	.	.	.	0.11	.	.	0.025	0.024	0.15	0.016	.	50 g
1	NCS HC37609	61.54	.	8.49	.	.	.	0.20	.	.	0.024	0.015	2.15	0.24	.	50 g
1	NCS HC93611	60.42	.	8.13	.	.	.	0.21	.	.	0.022	0.059	0.92	.	.	50 g
1	NCS HC28622	60.00	.	7.72	.	.	28.65	0.340	.	.	0.025	0.033	2.43	0.261	0.153	50 g
1	NCS HC93605	59.71	.	8.00	.	.	.	0.308	.	0.312	0.037	0.037	2.94	0.410	.	50 g
1	NCS HC37617	59.35	.	8.32	.	.	.	.	.	.	0.021	0.040	1.91	.	.	50 g
1	NCS HC28630	58.65	.	0.45	Ca:0.0012	0.020	.	0.35	As:0.0027	0.242	0.030	0.0015	1.43	Zn:0.010	0.154	50 g
1	NCS HC93609	58.28	.	8.36	.	.	.	0.207	.	.	0.023	0.068	1.15	.	.	50 g
1	NCS HC28619	56.76	.	7.28	.	.	30.22	0.300	.	.	0.023	0.024	4.25	0.412	0.203	50 g
1	NCS HC14615	56.16	.	8.07	.	.	.	0.23	.	.	0.017	0.045	2.30	.	.	50 g
1	NCS HC14614	55.81	.	7.67	.	.	.	0.28	.	.	0.018	0.032	2.57	.	.	50 g
1	NCS HC28620	55.77	.	7.60	.	.	31.41	0.382	.	.	0.022	0.031	3.95	0.423	0.175	50 g
1	NCS HC14613	54.04	.	7.56	.	.	.	0.18	.	.	0.020	0.032	2.58	.	.	50 g
2	BS 130/2	52.61	.	7.76	.	(0.007)	.	0.45	.	.	0.013	0.045	2.12	(0.10)	(0.38)	100 g
1	BS 130/1	51.6	.	7.12	.	(0.015)	.	1.25	.	Mo:(0.005)	0.014	0.034	4.41	(0.38)	(0.32)	100 g
1	ECRM 585-2	49.05	.	5.488	0.0622	.	38.67	0.801	0.0127	0.294	0.0255	0.0320	4.69	0.263	0.282	100 g
2	BS 130/3	49.01	.	6.54	.	(0.011)	.	0.76	.	.	0.014	0.029	6.25	(0.18)	(0.36)	100 g
1	SARM 144	49	.	.	.	.	36.9	0.33	.	0.21	.	.	5.31	0.67	0.37	100 g
1	VS F38	.	.	4.62	.	.	.	.	.	.	.	.	.	.	.	100 g
1	VS F12/3	.	.	0.289	.	.	.	.	.	.	.	.	.	.	.	100 g
1	VS F10/2	.	.	0.018	.	.	.	.	.	.	.	.	.	.	.	100 g
1	VS F9/2	.	.	0.012	0.042	.	.	.	.	.	.	.	.	.	.	100 g

#	Number	Cr	Al	C	Co	Cu	Fe	Mn	N	Ni	P	S	Si	Ti	V	Units
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= class, where 1 = CRM and 2 = RM analysis in mass % DH: 50 g NCS: 50-100 g IPT: 120 g JSS, MHCX: 150 g others: 100 g

#	Number	Mn	Fe	Si	C	P	S	As	Ca	Co	Cr	Cu	Ni	Pb	Ti	V	Zn	Other
1	VS F5/3	95.9	2.73	1.25	0.079	0.062	0.0095	.	.	.	.	0.0055	.	.	.	.	.	
1	NCS HC15606	92.92	6.64	0.47	0.047	0.020	0.012	.	.	.	.	.	.	.	.	.	.	
2	DH 1203	88.15	8.87	0.863	1.293	0.114	.	.	.	0.141	0.076	0.051	0.067	0.003	0.001	0.015	0.030	
2	DH 1207	88.00	8.780	1.113	1.630	0.081	.	.	.	0.038	0.060	0.016	0.022	.	.	0.026	0.009	
1	MHCX01	87.5	7.32	1.13	1.34	0.25	0.0040	.	.	.	0.16	0.11	0.06	.	0.009	.	.	Al: 0.006
1	VS F29/3	87.5	2.26	.	0.146	0.055	0.031	.	.	.	.	.	.	.	last of stock			N: 4.63
1	ECRM 583-1	86.42	.	0.396	0.333	0.146	(0.007)	.	.	.	.	.	.	.	.	.	.	
1	NCS HC15605	85.95	13.83	0.19	0.056	0.030	0.011	.	.	.	.	.	.	.	.	.	.	
1	NM 331	85.48	.	1.74	0.115	0.129	.	.	.	.	.	.	.	.	.	.	.	
1	NCS HC25629	84.28	.	0.62	0.300	0.196	0.0016	.	.	.	.	.	.	.	.	.	.	
1	NCS HC41601 *	83.35	13.48	0.948	0.86	0.180	(0.003)	0.048	.	0.145	0.335	0.107	0.080	0.068	.	(0.03)	0.12 *	see below
1	NCS HC28629	82.61	16.47	0.475	0.296	0.080	0.0022	0.017	0.0012	.	0.033	0.127	0.032	0.126	.	0.041	0.011	
1	NCS HC15607	82.59	16.59	0.73	0.135	0.033	0.0074	.	.	.	.	.	.	.	.	.	.	
1	NCS HC25619a	81.95	.	0.75	1.18	0.163	0.0018	.	.	.	.	.	.	.	.	.	.	
1	NCS HC25619b	81.74	.	0.75	1.20	0.163	0.0018	.	.	.	.	.	.	.	.	.	.	
1	NCS HC25629a	81.68	.	1.06	0.310	0.196	0.0022	.	.	.	.	.	.	.	.	.	.	
1	NCS HC37614	81.11	.	1.71	0.939	0.130	.	.	.	.	.	.	.	.	.	0.075	.	
1	NM 332	80.8	.	1.14	6.82	0.19	.	.	.	.	.	.	.	.	.	.	.	
1	IRSID 503-1	80.8	.	0.865	0.700	0.069	(0.009)	.	.	.	.	.	.	.	.	.	.	
1	NCS HC25629b	80.79	.	0.96	0.560	0.169	0.0024	.	.	.	.	.	.	.	.	.	.	
1	NCS HC25620	80.48	.	0.94	1.50	0.153	0.0030	.	.	.	.	.	.	.	.	.	.	
1	IPT 54	80.4	15.9	1.74	1.20	0.22	0.003	.	.	.	0.043	0.059	0.14	.	.	.	.	
2	DH 1206	80.24	16.91	0.350	1.482	0.229	.	0.158	.	0.167	0.105	0.088	0.140	.	.	0.072	.	Mo: 0.028
1	SRM 68c	80.04	12.3	0.225	6.72	0.19	0.008	0.021	.	.	0.074	.	.	.	.	.	.	
1	VS F7/4	79.8	12.75	0.269	6.8	0.372	0.0037	.	.	.	.	.	.	.	.	.	.	
1	MHCX02	79.7	8.76	4.71	5.04	0.50	0.0033	.	.	.	0.08	0.05	0.08	.	0.065	.	.	Al: 0.032
1	NCS HC25621	79.44	.	1.51	1.40	0.344	0.0029	.	.	.	.	.	.	.	.	.	.	
1	NCS HC25632	78.42	.	0.69	6.68	0.204	0.009	.	.	.	.	.	.	.	.	.	.	
2	DH 1216	78.30	17.03	.	1.44	0.123	.	0.003	.	0.019	0.071	0.005	0.047	.	.	0.019	0.007	
1	ECRM 502-2	77.87	.	.	6.94	0.148	.	.	.	.	0.0265	0.0370	0.0384	0.0179	0.0034	.	.	
1	NCS HC28628	76.55	17.86	1.84	1.84	0.265	0.017	0.055	0.0036	.	0.124	0.152	0.132	1.30	0.0065	0.100	0.0017	
1	JSS 701-6	74.4	.	(0.03)	6.94	0.112	(0.002)	.	.	.	.	.	.	.	.	.	.	
1	NCS HC25642	74.02	.	1.70	1.14	0.183	0.0065	.	.	.	.	.	.	.	.	.	.	N: 4.92
1	NCS HC11602	73.88	18.14	0.43	6.72	0.152	0.005	.	.	.	.	0.080	.	.	.	.	.	
1	NCS HC28626	66.44	26.62	0.073	6.26	0.268	0.0014	0.015	0.0054	.	0.032	0.072	0.109	0.106	0.0035	0.133	0.026	
1	NCS HC28627	66.27	26.60	0.208	6.23	0.428	0.0023	0.025	0.0040	.	0.026	0.070	0.087	0.077	0.027	0.110	0.022	
1	NCS HC28625	65.98	26.42	0.525	6.14	0.805	0.0034	0.047	0.0006	.	0.014	0.065	0.032	0.0092	0.081	0.055	0.0082	
1	NCS HC37611	65.75	.	0.64	6.57	0.382	0.0090	.	.	.	.	.	.	.	.	.	.	
#	Number	Mn	Fe	Si	C	P	S	As	Ca	Co	Cr	Cu	Ni	Pb	Ti	V	Zn	Other

* NCS HC41601 is 150g chips and also contains N:(0.018), O:(0.12), Sb: 0.015 and Sn: 0.0019

= class, where 1 = CRM and 2 = RM

#	Number	Mo	Fe	Si	C	Cr	Cu	Mn	N	Ni	O	P	S	W	Units
2	DH 2010	78.09	20.66	0.161	0.026	0.035	0.464	0.010	.	0.112	.	0.015	0.092	.	50 g
2	DH 2008	72.82	25.51	0.71	0.018	0.039	0.378	0.088	0.009	0.020	0.216	0.017	0.059	0.022	50 g
1	ECRM 578-1	72.23	.	0.208	0.016	.	0.136	.	.	.	.	0.024	0.065	.	100 g
2	DH 2012	69.99	27.82	0.790	0.011	.	0.390	0.042	0.014	.	0.534	.	0.084	.	50 g
1	NCS HC26610a	64.84	.	0.10	0.021	.	0.33	.	.	.	.	0.044	0.077	0.011	50 g
1	NCS HC25602a	62.19	.	0.20	0.020	.	0.159	.	.	.	.	0.031	0.042	.	50 g
1	NCS HC26610b	61.85	.	1.54	0.042	.	0.29	.	.	.	.	0.036	0.059	0.060	50 g
1	NCS HC37603	61.41	.	0.30	0.054	.	0.126	.	.	.	.	0.046	0.071	.	50 g
1	NCS HC19608	61.20	.	0.32	0.042	.	0.134	.	.	.	.	0.032	0.073	.	50 g
1	VS F17/3	61.2	.	0.48	0.42	.	0.31	.	.	.	.	0.042	0.085	0.022	100 g
1	NCS HC28624	61.00	37.22	0.367	0.019	0.052	1.07	0.039	.	0.144	.	0.044	0.078	0.047	50 g
1	NCS HC28623	60.61	38.48	0.275	0.032	0.011	0.368	0.185	.	0.033	.	0.031	0.047	0.034	50 g
1	VS F17/4	59.2	.	0.54	0.081	.	0.52	.	.	.	.	0.032	0.066	0.021	100 g
1	NCS HC19609	58.13	.	(0.039)	0.039	.	0.36	.	.	.	.	0.041	0.085	.	50 g
1	NCS HC37604	57.65	.	0.71	0.044	.	0.117	.	.	.	.	0.046	0.069	.	50 g
1	NCS HC93606	56.12	.	0.190	0.073	.	0.494	.	.	Sb:0.0036	.	0.037	0.044	.	50 g
#	Number	Al	As	Bi	Co	Pb	Sb	Sn	V	Zn					
DH 2010	0.008	.	.	0.020	.	.	.	.	0.022	.					
DH 2008	.	.	.	.	.	.	.	.	.	.					
ECRM 578-1	.	.	.	.	.	.	.	.	.	.					
DH 2012	.	.	.	.	.	.	.	.	.	.					
NCS HC26610a	.	0.015	.	.	(0.002)	(0.01)	(0.002)	.	.	.					
NCS HC25602a	.	.	.	.	.	.	.	.	.	.					
NCS HC26610b	.	0.008	.	.	.	.	(0.002)	(0.008)	.	.					
NCS HC37603	.	.	.	.	.	.	.	.	.	.					
NCS HC19608	.	.	.	.	.	.	.	.	.	.					
VS F17/3	.	0.021	0.0009	.	0.0051	0.024	0.0029	.	0.0038	.					
NCS HC28624	.	0.0078	.	.	0.0022	0.0059	0.0026	.	.	.					
NCS HC28623	.	0.016	.	.	0.0006	0.0043	0.0007	.	.	.					
VS F17/4	.	0.0011	0.00056	.	0.0029	0.0039	0.0023	.	0.0064	.					
NCS HC19609	.	.	.	.	.	.	.	.	.	.					
NCS HC37604	.	.	.	.	.	.	.	.	.	.					
NCS HC93606	.	.	.	.	.	.	.	.	.	.					

CRM FERRONICKEL

Number	Ni	As	C	Co	Cr	Cu	Fe	P	S	Si	Units
VS F41	91.4	0.058	0.0124	2.04	.	0.47	5.68	.	0.132	.	100 g
NCS HC25656	12.16	.	3.06	.	3.62	.	.	0.046	0.245	1.04	50 g

FERRONIIOBIUM

= class, where 1 = CRM and 2 = RM

* notes the total of Nb+Ta

#	Number	Nb	Fe	Si	Al	C	Cr	Cu	Mn	P	Pb	Sn	Ta	Ti	V	W	Zr
2	DH 2816	69.27	27.12	1.748	0.568	0.069	0.026	0.026	0.177	0.132	0.079	0.056	0.064	0.382	0.015	.	.
2	DH 2811	67.50	29.29	0.271	1.309	0.080	0.038	.	0.181	0.090	0.038	0.066	0.102	0.695	0.011	.	.
1	NCS HC25650	66.34	.	1.01	0.89	0.074	.	0.023	.	0.085	.	.	(0.081)	0.49	.	.	.
1	NCS HC18606	66.24	.	1.09	1.35	0.070	.	.	0.29	0.159	.	.	0.084	0.78	.	.	.
1	NCS HC93607	64.60	.	1.04	1.50	0.101	.	0.038	.	0.194	.	.	0.097	0.585	.	.	.
1	VS F20/3	63.5*	33.3	0.67	0.35	0.136	.	.	.	0.039	.	0.0014	63.5*	0.292	.	.	.
1	ECRM 579-1	62.87	.	1.03	1.86	0.037	.	.	.	0.064	.	0.344	3.85	0.567	.	.	.
2	DH 2815	60.15	28.77	1.580	4.82	0.043	0.028	0.209	0.842	0.065	0.140	1.38	0.856	0.185	0.013	0.064	0.105
2	DH 2809	60.12	27.46	3.47	2.22	0.495	0.035	0.037	0.530	0.097	0.010	.	0.217	1.35	0.878	.	0.238
1	ECRM 576-1	43.90	.	1.79	2.53	0.201	.	.	.	.	.	0.195	0.306	1.32	.	.	.

Number	Co	Mg	Mo	N	Ni	S	Units
DH 2816	.	.	.	.	0.006	0.025	50 g
DH 2811	.	.	.	.	0.012	0.085	50 g
NCS HC25650	.	.	.	.	.	0.028	50 g
NCS HC18606	.	.	.	.	.	0.008	50 g
NCS HC93607	.	.	.	.	.	0.013	50 g
VS F20/3	0.0056	.	.	0.067	.	0.0091	100 g
ECRM 579-1	0.005	.	.	.	.	0.021	100 g
DH 2815	.	0.076	0.020	.	0.019	0.056	50 g
DH 2809	0.003	.	.	.	0.017	.	50 g
ECRM 576-1	.	.	.	.	.	.	100 g

FERROPHOSPHORUS

= class, where 1 = CRM and 2 = RM

analysis listed in mass %

#	Number	P	Fe	Al	C	Ca	Cr	Cu	Mn	Nb	Ni	S	Si	Ti	V	Units
1	NCS HC93622	27.50	.	.	0.228	.	0.226	.	0.70	.	.	0.017	0.156	0.53	.	50 g
1	SRM 90	26.2	.	.	.	.	.	.	.	.	.	.	.	.	.	75 g
2	DH 2204	25.69	69.2	0.056	0.043	0.681	0.077	0.214	0.964	0.038	0.047	0.023	1.238	0.836	0.150	50 g
1	VS F28/2	16.05	.	.	.	.	.	.	1.20	.	.	0.021	1.11	.	.	100 g

FERROTITANIUM

= Class, where 1 = CRM and 2 = RM

#	Number	Ti	Al	Sol.Al	C	Co	Cr	Cu	Fe	Mn	P	S	Si	V	Zr
1	VS F30/4	70.3	3.83	.	0.154	.	0.154	0.065	21.51	0.189	0.0030	0.0054	0.163	2.29	0.231
1	NCS HC15601	70.02	0.3	.	0.057	.	0.039	0.037	26.57	0.106	0.0071	0.0047	1.47	0.011	.
1	VS F30/3	70	3.63	.	0.308	.	0.58	0.113	19.74	0.335	0.0044	0.012	0.4	0.56	0.397
1	NCS HC19604	43.81	10.64	.	0.041	.	.	.	.	1.59	0.051	0.011	3.46	0.158	.
1	NCS HC19605	38.81	8.61	.	0.032	.	.	0.025	.	0.81	0.032	0.009	4.20	0.303	.
1	ECRM 584-1	37.17	7.19	(6.0)	0.044	.	.	.	.	1.13	0.032	0.030	1.80	.	.
1	NCS HC93608	32.22	3.00	.	0.095	.	.	0.281	.	0.255	0.014	0.015	0.30	.	.
1	VS F43	31.9	11.11	.	0.098	.	0.354	0.336	.	1.22	0.038	0.0058	2.50	0.152	0.059
1	NCS HC26613	30.24	8.13	.	0.019	.	.	(0.005)	.	1.11	0.020	0.012	1.84	0.19	.
1	NCS HC18604	27.93	5.38	.	0.065	.	.	0.117	.	2.67	0.043	0.013	4.68	.	.
1	NCS HC26609	27.47	6.21	.	0.048	.	.	0.102	.	2.36	0.035	0.020	5.61	.	.
1	NCS HC28638	27.34	7.82	.	0.033	.	0.055	.	.	0.362	0.015	0.0048	4.51	0.15	.
1	VS F42	27.13	11.41	.	0.55	.	2.22	1.32	.	1.1	0.05	0.023	6.74	.	.
1	IRSID 510-1	26.95	(4.9)	.	0.058	.	.	.	.	.	(0.035)	.	4.65	.	.
1	NM 341	24.91	5.54	.	.	.	.	.	.	.	.	.	2.55	.	.
2	BS FeTi-1	19.9	12.5	.	0.57	0.028	0.33	0.60	.	7.7	0.050	0.009	2.9	0.69	3.6
2	BS FeTi-2	19.4	12.7	.	0.46	0.04	0.30	0.43	.	7.91	0.053	0.012	3.2	0.81	3.6

Number	B	Ca	Mg	Mo	N	Nb	Ni	Pb	Sn	W	Zn	Units
VS F30/4	.	.	.	0.60	0.38	.	0.053	.	0.077	.	.	100 g
NCS HC15601	.	.	.	0.028	.	.	0.29	.	.	.	.	50 g
VS F30/3	.	.	.	0.92	0.68	.	0.6	(0.0006)	0.1	.	(0.003)	100 g
NCS HC19604	.	.	.	.	.	.	.	.	0.056	.	.	100 g
NCS HC19605	.	.	.	.	.	.	.	.	0.061	.	.	100 g
ECRM 584-1	.	.	.	.	.	.	.	.	.	.	.	100 g
NCS HC96308	.	.	.	.	.	.	.	.	.	.	.	50 g
VS F43	.	.	.	0.0036	0.085	.	.	.	0.013	.	0.032	100 g
NCS HC26613	.	.	.	.	.	.	.	.	.	.	.	50 g
NCS HC18604	.	.	.	.	.	.	.	.	.	.	.	50 g
NCS HC26609	.	.	.	.	.	.	.	.	.	.	.	50 g
NCS HC28638	.	.	.	.	.	.	.	.	.	.	.	50 g
VS F42	.	.	.	0.106	.	.	.	.	0.33	0.129	.	100 g
IRSID 510-1	.	.	.	.	.	.	.	.	.	.	.	100 g
NM 341	.	.	.	.	.	.	.	.	.	.	.	100 g
BS FeTi-1	0.60	1.12	(0.4)	0.06	0.143	0.05	0.17	.	0.11	.	(0.04)	100 g
BS FeTi-2	1.10	0.96	(0.4)	0.15	0.16	0.03	0.16	.	0.16	.	(0.02)	100 g

CRM FERROTUNGSTEN

Number	W	Si	Al(tot)	As	C	Cr	Cu	Fe	Mn	Mo	P	Pb	S	Sb	Sn	Units
ECRM 555-1	79.9	1.75	0.14	.	0.025	.	.	(15.2)	.	.	(0.02)	.	(0.018)	.	0.034	100 g
ECRM 590-1	79.55	1.05	(0.36)	.	0.0250	.	0.0484	.	0.136	0.101	.	.	.	.	0.045	100 g
NCS HC25606a	76.24	0.34	.	0.041	0.036	.	0.079	.	0.102	.	0.033	.	0.052	.	0.041	50 g
VS F18/2	74.7	0.35	.	0.028	0.075	.	0.105	.	0.095	0.56	0.042	0.00014	0.071	0.0069	0.038	100 g
VS F48	71.0	0.47	0.64	0.037	0.074	.	0.096	.	0.695	0.047	0.035	0.0048	0.211	0.014	0.031	100 g

FERROVANADIUM

= Class, where 1 = CRM and 2 = RM

#	Number	V	Fe	Si	Al	C	Cr	Cu	Mg	Mn	Mo	N	Ni	P	S
1	NCS HC93629	80.90	.	0.86	1.33	0.032	.	.	.	0.046	.	.	.	0.036	0.014
1	IRSID 511-1	80.7	.	0.341	.	0.049	.	.	.	.	.	.	.	(0.016)	0.018
1	VS F40	80.1	.	1.31	2.12	0.096	0.185	0.81	.	1.49	.	.	.	0.022	0.014
1	ECRM 591-1	79.72	14.59	0.847	3.19	0.141	.	0.0596	.	0.307	.	(0.308)	0.0141	0.0299	0.0153
1	NCS HC28633	54.02	.	0.682	0.0026	0.285	0.110	0.054	.	0.663	.	.	0.011	0.056	0.0044
1	NCS HC26608c	53.78	.	0.81	(0.0025)	0.17	0.71	.	.	2.00	.	.	.	0.043	0.0040
1	NCS HC26614	53.71	.	1.35	0.04	0.39	.	.	.	0.27	.	0.095	.	0.060	0.023
1	NM 351	52.10	.	.	.	.	.	.	.	.	.	.	.	.	.
1	NCS HC19606	51.14	.	0.68	0.084	0.565	0.32	.	.	0.43	.	.	.	0.087	0.010
1	NCS HC26608b	50.57	.	0.84	(0.002)	0.22	0.70	.	.	1.64	.	.	.	0.051	0.0044
1	NCS HC93628	50.24	.	0.730	6.10	0.130	.	.	.	0.474	.	.	.	0.042	0.016
1	ECRM 577-1	50.16	.	1.79	0.414	0.089	.	0.054	.	0.158	.	.	0.053	0.035	0.034
1	NCS HC93628a	50.09	.	0.730	6.03	0.152	.	.	.	0.475	.	.	.	0.043	0.017
1	NCS HC37616	49.72	.	0.50	5.18	0.081	.	.	.	0.58	.	.	.	0.016	0.012
1	NCS HC18608	48.93	.	0.76	0.158	0.40	.	.	.	0.26	.	.	.	0.049	0.043
1	NCS HC28634	47.32	.	1.89	0.0061	0.475	0.289	0.064	.	0.365	.	.	0.067	0.093	0.014
1	BS FeV 45	45.1	33.7	4.90	0.017	0.241	5.82	0.40	0.014	4.12	0.0079	0.26	4.32	(0.13)	0.334
1	VS F19/3	42.6	.	1.47	(0.005)	0.418	1.21	0.204	.	3.30	.	.	.	0.059	0.0102
2	BS FeV 42	42.35	39.45	3.81	(0.06)	0.30	5.21	0.31	(0.06)	3.37	0.024	0.20	3.85	0.12	0.31
1	VS F32/3	40.2	(40)	(1.2)	(<0.05)	(0.4)	.	(0.2)	.	3.14	.	7.51	.	(0.05)	(0.008)

Number	As	Ca	O	Pb	Ti	Units
NCS HC93629	.	.	.	.	.	25 g
IRSID 511-1	.	.	.	.	.	100 g
VS F40	.	.	.	.	.	100 g
ECRM 591-1	0.0022	.	.	.	.	100 g
NCS HC28633	0.0017	0.022	.	0.0006	.	50 g
NCS HC26608c	.	.	.	Zn:(0.004)	.	50 g
NCS HC26614	.	.	(0.67)	.	.	50 g
NM 351	.	.	.	.	.	100 g
NCS HC19606	.	.	.	.	.	50 g
NCS HC26608b	.	.	.	Zn:(0.0024)	.	50 g
NCS HC93628	.	.	.	.	.	30 g
ECRM 577-1	.	.	.	.	.	100 g
NCS HC93628a	.	.	.	.	.	30 g
NCS HC37616	.	.	.	.	.	50 g
NCS HC18608	.	.	.	.	.	50 g
NCS HC28634	0.024	0.115	.	0.0004	.	50 g
BS FeV 45	(0.013)	0.010	.	.	0.021	100 g
VS F19/3	0.0009	.	.	.	.	100 g
BS FeV 42	.	(0.042)	.	.	0.033	100 g
VS F32/3	(<0.001)	.	.	.	.	100 g

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CRM RARE EARTH FERROSILICON

* VS F31/2 lists Rare Earth Oxides

Number	RE	Si	Fe	Ca	Mg	Mn	Ti	Al	C	Ce	Cu	La	Units
VS F31/3 *	39.0	39.6	16.26	1.76	0.320	.	.	7.60	0.032	15.65	0.51	.	100 g
NCS HC28614	26.38	38.92	.	6.26	.	0.460	0.416	.	.	.	.	.	100 g
NCS HC28613	23.78	40.00	.	5.00	.	0.455	0.280	.	.	.	.	.	100 g
NCS HC39602	21.20	37.18	22.18	1.98	10.56	3.43	1.92	.	.	.	.	.	100 g
NCS HC39601	20.09	40.31	20.81	3.21	9.50	2.72	1.50	.	.	.	.	.	100 g
NCS HC28615	20.00	41.02	.	5.60	.	0.390	0.235	.	.	.	.	.	100 g
NCS HC39603	18.10	43.55	21.78	2.65	8.51	2.23	1.35	.	.	.	.	.	100 g
NCS HC28609	8.66	43.90	(31.67)	1.01	10.20	0.70	0.54	.	.	.	.	.	80 g
NCS HC28612	6.42	43.44	(36.43)	0.90	8.25	0.63	0.435	.	.	.	.	.	80 g
NCS HC28611	5.10	43.22	(40.7)	0.84	5.70	0.55	0.362	.	.	.	.	.	80 g
NCS HC28610	3.71	42.05	(43.4)	0.76	5.52	0.46	0.275	.	.	(1.86)	.	(0.88)	80 g

last last

FERROSILICOCALCIUM, FERROSILICOCHROMIUM, and FERROSILICOTITANIUM

= class, where 1 = CRM and 2 = RM

DH: 50 g units

VS: 100 g units

#	Number	Si	Fe	Ca	Cr	Ti	Al	C	Cu	Mg	Mn	Mo	Ni	P	S	V	Zr
2	DH 2902	59.25	24.80	0.220	0.059	11.21	0.613	0.284	0.022	0.234	1.64	0.126	0.043	0.010	0.005	0.154	0.046
2	DH 2901	56.73	26.58	0.200	0.062	12.03	0.597	0.183	0.021	0.210	1.72	0.149	0.044	0.013	0.005	0.161	0.046
1	VS F25/3	51.5	23.06	21.3	.	.	0.67	.	.	.	.	.	.	0.011	0.0056	.	.
2	DH 5403	40.46	20.93	0.028	36.93	0.124	0.579	0.034	0.020	.	0.41	.	0.190	0.022	.	0.074	0.005
1	VS F24/2	49.9	.	.	29.2	.	0.9	0.02	.	.	.	.	.	0.03	0.002	.	.

FERROSILICON

= Class, where 1 = CRM and 2 = RM

#	Number	Si	Fe	Al	C	Ca	Cr	Cu	Mn	Ni	P	S	Ti
1	BAM 529-1	91.11	6.15	0.86	0.10	0.46	.	0.01	0.04	.	0.013	.	0.09
1	NCS HC14606	78.96	20.24	0.24	0.024	0.064	0.0053	0.049	0.058	0.035	0.0093	0.0037	0.032
1	DH 2314	78.33	19.89	0.410	0.031	0.094	0.082	0.049	0.190	0.044	0.028	.	0.067
1	VS F3/3	77.7	.	1.96	0.049	0.40	0.095	.	0.122	.	0.025	0.0023	0.121
1	NCS HC14612	77.49	22.12	0.0074	0.016	0.0067	0.0044	0.011	0.020	0.016	0.0074	0.0030	0.011
1	NCS HC25647	77.42	.	0.011	0.0068	0.0030	0.010	.	0.074	.	0.012	0.003	0.043
2	DH 2315	77.17	19.88	1.316	0.042	0.357	0.143	0.042	0.159	0.048	0.023	.	0.086
1	CMSI 1655	76.74	.	1.80	0.081	0.30	0.14	.	0.17	.	0.023	0.004	.
1	NCS HC25627	76.74	.	1.80	0.081	0.30	0.140	.	0.172	.	0.023	0.004	.
2	DH 2305	76.58	18.62	1.64	0.238	1.45	0.021	0.009	0.070	0.004	0.016	.	0.107
1	NCS HC93603	76.53	19.07	1.52	0.095	1.373	0.043	0.025	0.281	0.012	0.019	0.0023	0.085
1	NCS HC25618	76.42	.	0.78	0.066	0.19	0.097	.	0.14	.	0.025	0.003	.
1	NCS HC93617	76.34	19.43	1.75	0.220	1.31	0.027	0.015	0.237	0.0056	0.025	0.0039	0.119
1	DH 2310	75.94	19.42	2.041	0.11	1.019	0.019	0.011	0.139	0.006	0.021	.	0.093
1	NCS HC15602	75.9	23.65	0.011	0.0074	(0.0013)	0.077	0.057	0.149	0.026	0.014	0.0035	0.027
1	JK 39	75.9	21.6	1.45	0.105	0.24	.	0.013	0.165	.	0.018	.	0.116
1	NCS HC93601	75.46	20.23	1.40	0.148	1.15	0.044	0.019	0.588	0.0093	0.021	0.0026	0.097
1	SRM 195	75.3	23.6	0.046	0.034	0.053	0.047	0.047	0.17	0.032	0.017	0.001	0.037
1	IPT 143	75.1	22.4	0.57	0.054	0.79	0.0044	0.014	0.110	0.0028	0.025	0.0012	0.068
1	NCS HC93602	74.81	20.96	1.28	0.196	0.986	0.052	0.013	1.09	0.0071	0.024	0.0052	0.106
1	VS F4/2	74.1	.	0.076	0.023	(0.03)	0.119	0.073	0.14	0.061	0.024	(0.002)	0.094
1	NCS HC11601a	73.75	.	1.14	0.073	0.34	0.085	0.031	0.26	.	0.023	0.003	.
1	NCS HC93616	73.61	21.06	2.14	0.208	2.05	0.022	0.019	0.237	0.0069	0.023	0.0033	0.121
1	NCS HC37602	73.29	21.37	2.74	.	0.616	.	.	0.14	.	0.022	.	.
1	SRM 58a	73.20	25.23	0.95	0.014	0.30	0.020	0.024	0.16	0.012	0.009	<0.002	0.051
1	NM 31.3	72.8	.	1.48	.	0.62	.	.	0.16	.	0.03	.	.
1	NCS HC18601	72.44	.	2.16	0.19	0.64	0.109	.	0.205	.	0.019	0.010	.
1	NCS HC19602	69.47	23.81	2.45	0.12	2.47	0.077	.	0.308	.	0.027	.	.
1	NCS HC37601	68.91	26.88	2.18	.	.	0.142	.	0.177	.	0.024	.	.
1	NCS HC14607	55.73	41.89	0.78	0.19	0.14	0.014	0.060	0.22	0.0063	0.038	0.0048	0.119
2	BS 140/2	51.85	46.12	0.62	(0.03)	0.03	(0.25)	0.14	0.53	0.15	(0.02)	(0.004)	0.10
1	NCS HC25652	51.85	.	.	0.35	.	.	.	.	.	0.014	0.003	0.052
2	DH 2311	50.00	9.06	4.36	8.31	7.84	0.027	0.016	0.080	0.007	0.011	0.048	0.070
2	BS 140/4	49.80	47.50	0.90	(0.05)	0.09	(0.19)	0.09	1.00	0.11	(0.02)	(0.004)	0.09
2	DH 2312	48.30	12.38	3.40	4.96	10.48	0.083	0.020	0.114	0.013	0.011	0.056	0.062
1	SRM 59a	48.10	50.05	0.35	0.046	0.042	0.080	0.052	0.75	0.033	0.016	0.002	.
2	BS 140/3	47.20	50.85	0.59	(0.05)	0.09	(0.18)	0.09	0.60	0.09	(0.02)	(0.004)	0.07
2	BS 140/1	45.20	52.80	0.68	(0.03)	0.04	(0.25)	0.13	0.46	0.15	(0.02)	(0.004)	0.09
1	IPT 70	44.7	54.1	0.21	0.087	0.16	0.046	0.066	0.283	0.022	0.018	(0.006)	0.018
1	VS F2/4	44.3	.	0.83	0.045	0.032	0.242	.	0.302	.	0.031	0.0024	.
1	VS F2/3	44.2	.	1.03	0.027	0.056	0.324	.	0.306	.	0.035	0.0023	.
1	VS F1/3	24.5	.	0.74	0.499	.	0.361	.	0.510	.	0.042	0.0027	0.072
1	SARM 33	15.60	80.2	0.62	1.01	.	0.43	0.29	0.75	0.28	0.043	.	.

#	Number	Si	Fe	Al	C	Ca	Cr	Cu	Mn	Ni	P	S	Ti		
	Number	As	B	Ba	Co	Mg	Mo	N	O	Sn	Sr	V	Zn	Zr	Units
	BAM 529-1	.	.	.	.	0.04	.	.	.	.	.	.	.	.	100 g
	NCS HC14606	0.0012	0.0029	0.0060	0.0031	0.0051	0.0013	.	(0.256)	0.0003	.	0.0024	.	.	70 g
	DH 2314	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
	VS F3/3	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	NCS HC14612	.	0.0022	.	0.0012	.	.	.	.	.	.	.	.	.	80 g
	NCS HC25647	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
	DH 2315	.	.	.	.	0.025	.	.	.	.	.	.	.	0.008	50 g
	CMSI 1655	.	.	.	.	.	.	.	.	.	.	.	.	.	70 g
	NCS HC25627	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
	DH 2305	.	.	.	.	0.013	.	.	.	.	.	0.005	.	.	50 g
	NCS HC93603	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
	NCS HC25618	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
	NCS HC93617	.	.	.	.	.	.	.	.	.	.	.	.	.	80 g
	DH 2310	.	.	0.042	.	0.029	.	.	.	.	.	.	.	.	50 g
	NCS HC15602	.	.	.	.	.	.	.	.	.	.	0.0036	.	.	50 g
	JK 39	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
	NCS HC93601	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
	SRM 195	.	0.0010	.	<0.01	.	.	.	.	.	.	.	.	0.011	75 g
	IPT 143	.	.	0.126	.	0.039	.	.	.	.	0.014	.	.	0.082	50 g
	NCS HC93602	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
	VS F4/2	.	.	.	.	.	.	(0.02)	.	.	.	.	0.0013	.	100 g
	NCS HC11601a	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	NCS HC93616	.	.	.	.	.	.	.	.	.	.	.	.	.	80 g
	NCS HC37602	.	.	.	.	.	.	.	.	.	.	.	.	.	80 g
	SRM 58a	.	0.0010	.	<0.01	.	.	.	.	.	.	.	.	0.002	75 g
	NM 31.3	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	NCS HC18601	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
	NCS HC19602	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	NCS HC37601	.	.	.	.	.	.	.	.	.	.	.	.	.	80 g
	NCS HC14607	0.0015	0.0032	0.0043	0.0047	0.0068	0.011	.	(0.665)	0.0004	.	0.011	.	.	70 g
	BS 140/2	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	NCS HC25652	.	.	.	.	.	.	28.15	.	.	.	.	.	chips	50 g
	DH 2311	.	.	.	.	1.153	.	.	.	.	.	.	.	.	50 g
	BS 140/4	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	DH 2312	.	.	.	.	0.193	.	.	.	.	.	.	.	.	50 g
	SRM 59a	.	0.058	.	.	.	.	.	.	.	.	.	.	.	50 g
	BS 140/3	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	BS 140/1	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	IPT 70	.	.	.	.	0.016	.	.	.	.	.	.	.	.	60 g
	VS F2/4	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	VS F2/3	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	VS F1/3	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
	SARM 33	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g

Number	As	B	Ba	Co	Mg	Mo	N	O	Sn	Sr	V	Zn	Zr	Units
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CRM WELDING FLUX

Number	Al ₂ O ₃	C	CaF ₂	CaO	Fe	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P	S	SiO ₂	Units
VS SH7/3	29.8	.	28.5	24	.	0.56	0.94	11.4	0.4	1.41	0.011	0.031	23.4	100 g
VS SH8/4	26.5	0.039	68.6	52.7	0.147	.	.	.	.	.	0.013	0.013	1.77	100 g
VS SH6/2	3.00	.	7.71	12.72	.	1.3	.	1.6	38.5	.	0.069	0.0092	39.2	125 g

CRM GLASS

	BCR: 100x100x10mm (300g)				BGIRA-EC: 75 x 75 x 6mm			NCS: 50g powder			SGT: 25g pieces			SRM: 45g powder			SV: 30-40mm Ø x 4mm			
Number	SiO ₂	Al ₂ O ₃	B ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	Li ₂ O	MgO	Na ₂ O	PbO	SO ₃	TiO ₂	ZnO	ZrO ₂	LOI	Other		
SRM 92	(75.0)	(1.5)	0.70	.	(8.3)	.	.	(0.6)	.	(0.1)	(13.1)	.	.	.	(0.2)	.	(0.42)	R ₂ O ₃ =Al ₂ O ₃		
SGT G6	73.06	1.70	.	.	9.97	.	0.034T	<0.1	.	<0.1	14.65	.	0.20T	0.02	.	.	.			
SGT G10	72.7	1.62	.	0.02	10.7	0.020	0.325	0.35	.	1.81	12.2	.	0.05	0.097	.	(0.024)	.			
SV 4005	72.69	1.03	.	0.016	6.03	.	0.050	0.564	.	4.12	15.11	.	0.324	0.035	.	.	.			
SGT G7	72.64	1.50	.	.	11.03	.	0.044T	0.43	.	0.14	13.90	.	0.19T	0.042	.	.	0.07			
SV 4004	72.45	(0.60)	.	0.010	8.61	.	0.042	0.298	.	3.98	13.49	.	0.236	0.037	.	.	.			
BGIRA EC 1.1	71.94	1.22	.	.	7.70	.	0.077	0.43	.	4.01	14.22	.	0.27	0.029	.	.	.			
SV 4007	71.85	1.49	.	0.026	7.33	0.0040	0.298	0.703	.	4.74	13.34	.	0.038	0.032	.	.	.			
SGT G11	70.7	1.83	.	0.03	10.3	0.205	0.342	0.69	.	2.14	13.6	.	0.06	0.068	.	(0.015)	.			
SV 4006	70.14	2.12	.	0.051	9.89	0.0115	0.287	0.938	.	2.82	13.30	.	0.151	0.046	.	0.013	.			
SGT G4	69.49	3.02	0.19	.	4.24	.	0.099	0.57	.	<0.05	15.45	.	<0.05	0.041	3.28	.	0.22	F: 4.96		
BCR 126A	57.80	0.128	.	1.04	1.033	.	0.0055	10.00	0.495	0.512	3.58	23.98	.	.	1.02	.	.	Sb ₂ O ₃ : 0.29		
SGT G8	56.34	0.05	0.36	.	<0.02	.	0.010T	11.85	.	<0.02	0.23	30.59	.	0.02	.	.	0.21	As ₂ O ₃ : 0.32T		
NCS DC61104	53.98	14.50	8.87	.	16.54	.	0.34	0.59	.	4.40	0.096	.	.	0.19	.	.	0.26	Z ₂ F ₃ : 0.54		

GLASS

= class, where 1 = CRM and 2 = RM analysis listed in mass %

#	Number	Type	SiO ₂	Al ₂ O ₃	B ₂ O ₃	BaO	CaO	CdO	K ₂ O	MgO	Na ₂ O	PbO	SO ₃	SrO	TiO ₂	ZnO
1	SRM 93a	Borosilicate	80.8	2.28	12.56	.	0.01	.	0.014	0.005	3.98	.	.	.	0.014	.
1	SRM 1831	Soda-Lime	73.08	1.21	.	.	8.20	.	0.33	3.51	13.32	.	0.25	.	0.019	.
1	SRM 1830	Soda-Lime	73.07	0.12	.	.	8.56	.	0.04	3.90	13.75	.	0.26	.	0.011	.
1	SGT G10D	Soda-Lime	72.7	1.62	.	0.02	10.7	.	0.35	1.81	12.2	.	0.05	.	0.097	.
1	SGT G7D	Soda-Lime	72.64	1.50	.	.	11.03	.	0.43	0.14	13.90	.	0.19	.	0.042	.
1	SRM 620	Soda-Lime	72.08	1.80	.	.	7.11	.	0.41	3.69	14.39	.	0.28	.	0.018	.
1	SGT G11D	Soda-Lime	70.7	1.83	.	0.03	10.3	.	0.69	2.14	13.6	.	0.06	.	0.068	.
1	SV 4001	Leaded	69.55	1.87	1.09	0.014	1.80	.	10.43	1.11	5.73	6.53	.	.	0.022	(0.002)
1	SGT G4D	Soda-Lime	69.49	3.02	0.19	.	4.24	.	0.57	<0.05	15.45	.	<0.05	.	0.041	3.28
1	SV 4003	Leaded	59.49	0.119	(0.02)	(0.003)	(0.014)	.	12.34	(0.006)	1.85	23.97	.	.	0.019	1.55
1	SRM 1411	Borosilicate	58.04	5.68	10.94	5.00	2.18	.	2.97	0.33	10.14	.	.	0.09	0.02	3.85
1	SRM 1412	Multicomponent	42.38	7.52	4.53	4.67	4.53	4.38	4.14	(4.69)	4.69	4.40	.	4.55	.	4.48

Number	As ₂ O ₃	Cl	Cr ₂ O ₃	F	FeO	Fe ₂ O ₃	Li ₂ O	ZrO ₂	Units	
SRM 93a	.	0.060	.	.	0.016	0.028 (T.Fe)	.	0.042	1 Disc	32 mm Ø x 6 mm
SRM 1831	.	.	.	.	0.025	0.087 (T.Fe)	.	.	3 Plates	37 mm x 37 mm x 3 mm
SRM 1830	.	.	.	.	0.032	0.121 (T.Fe)	.	.	3 Plates	38 mm x 38 mm x ~6 mm
SGT G10D	.	.	0.020	.	.	0.325	.	(0.024)	1 Disc	40 mm Ø
SGT G7D	.	.	.	.	.	0.044 (T.Fe)	.	.	1 Disc	40 mm Ø LOI: 0.07
SRM 620	0.056	.	.	.	.	0.043	.	.	3 Plates	35 mm x 35 mm x 3 mm
SGT G11D	.	.	0.205	.	.	0.342	.	(0.015)	1 Disc	40 mm Ø
SV 4001	0.430	.	(0.0026)	(0.85)	.	0.038	.	(0.013)	100 g chips or 1 Disc	~40mmØ
SGT G4D	.	.	.	4.96	.	0.099	.	.	1 Disc	40 mm Ø LOI: 0.22
SV 4003	0.161	.	(0.0006)	(0.42)	.	0.017	.	0.025	100 g chips or 1 Disc	~40mmØ
SRM 1411	.	.	.	.	.	0.050	.	.	10 Plates	32 mm x 32 mm x 3 mm
SRM 1412	.	.	.	.	.	(0.031)	(4.50)	.	8 Plates	32 mm x 32 mm x 3 mm

CRM TRACE ELEMENTS IN GLASS

analysis listed in mg/kg glass plate 50 mm x 50 mm x 7 mm

Number	As	Ba	Cd	Cl	Co	Cr	Pb	Sb	Se
BCR 664	5.9	29.1	5.7	68.4	2.77	2.65	53.1	24.3	8.6

CRM FLOAT GLASS FOR DETERMINATION OF ABRADABILITY INDEX

Number	Mass Loss	Units
ASCRM 002-1	1.26 g	plate, 6 x 50 x 75 mm
ASCRM 002-2	13.55 g	plate, 10 x 100 x 100 mm

CRM GLASS CONTAINING HEXAVALENT CHROMIUM

certified analysis listed in mg/kg informational analysis listed in mass % 50 g of < 10 mm glass pieces

Number	Hexavalent Cr	Total Cr	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	CuO	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	SO ₃	SiO ₂	ZnO
BAM S004 uncertainty	94 5	471 25	2.15	1.2	9.4	0.07	0.04	0.06	0.16	0.90	14.5	0.17	70.9	0.33

CRM MULTI-ELEMENT GLASS DISCSlisted in mg/kg each unit contains uncertified 72% SiO₂, 12% CaO, 14% Na₂O, and 2% Al₂O₃. Each sample is 6 wafers ~13 mm Ø with choice of height

3 mm	1 mm	Ag	Au	B	Ba	Cd	Ce	Co	Cu	Dy	Er	Eu	Fe	Ga	Gd	K	La
SRM 610	SRM 611	(254)	(25)	(351)	(41)	.	.	(390)	(444)	.	.	.	458	.	.	(461)	.
SRM 612	SRM 613	22.0	(5)	(32)	(39)	(35.5)	(37.7)	(35)	(39)	(36)	(36)	(0.99)	51	(1.3)	(39)	(64)	(36)
SRM 614	SRM 615	0.42	(0.5)	(1.30)	.	(0.55)	.	(0.73)	1.37	.	.	.	(13.3)	(1.3)	.	30	(0.83)
SRM 616	SRM 617	.	(0.18)	(0.20)	.	.	.	.	(0.80)	.	.	.	(11)	(0.23)	.	29	(0.034)

3 mm	1 mm	Mn	Nd	Ni	Pb	Rb	Sb	Sc	Sm	Sr	Th	Ti	Tl	U	Yb	Zn
SRM 610	SRM 611	485	.	458.7	426	425.7	.	.	.	515.5	457.2	(437)	(61.8)	461.5	.	(433)
SRM 612	SRM 613	(39.6)	(36)	38.8	38.57	31.4	.	.	(39)	78.4	37.79	(50.1)	(15.7)	37.38	(42)	.
SRM 614	SRM 615	.	.	(0.95)	2.32	0.855	(1.06)	(0.59)	.	45.8	0.748	(3.1)	(0.269)	0.823	.	.
SRM 616	SRM 617	.	.	.	1.85	(0.100)	(0.078)	(0.026)	.	41.72	0.0252	(2.5)	(0.0082)	(0.0721)	.	.

CRM URANIUM IN GLASS

analysis listed in mg/kg 12 mm Ø x 5 mm

Number	U
IRMM 540R	15.0
IRMM 541	49.4

CRM GLASS SAND

T = Total

SGT: 200 g

SRM 89: 45 g

other SRM: 75 g

all others: 100 g units

Number	SiO ₂	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	MnO	Mn ₃ O ₄	Na ₂ O	P ₂ O ₅	PbO	SO ₃	TiO ₂	ZrO ₂	LOI
IPT 61	99.79	0.054	.	(0.004)	.	0.014	(0.007)	(0.003)	.	.	(0.002)	.	.	.	0.026	0.010	(0.06)
BCS 531	99.74	0.0327	0.00112	0.0040	.	0.00636	0.0039	0.00132	0.00014	.	.	0.00082	SrO:0.00017	.	0.0160	.	.
UNS SPS	99.32	0.248	.	0.029	.	0.037	0.058	0.0071	.	.	0.045	.	.	.	0.035	.	0.167
BCS 516	98.73	0.513	0.0040	0.0243	0.0081	0.0596	0.127	0.0387	.	0.0012	0.0195	(0.013)	0.0127	.	0.175	(0.075)	0.24
SGT S6	98.66	0.60	.	<0.02	.	0.032T	0.40	<0.02	.	.	<0.02	.	.	.	0.024	.	0.14
SGT S8	95.63	2.07	.	0.06	.	0.26 T	1.06	0.12	.	.	0.20	.	.	.	0.073	.	0.48
BCS 528	95.62	2.447	0.0298	0.237	0.0008	0.1111	0.875	0.0887	.	.	0.101	(0.20)	0.0006	.	0.0486	(0.014)	0.271
SRM 1413	82.77	9.90	0.12	0.74	.	0.24	3.94	0.06	.	.	1.75	.	.	.	0.11	.	.
SRM 89 *	65.35	0.18	1.40	0.21	.	0.049	8.40	0.03	0.088	.	5.70	0.23	17.50	0.03	0.01	0.005	0.32
SRM 81a	.	0.66	.	.	0.0046	0.082	.	.	.	.	.	.	.	.	0.12	0.034	.
SRM 165a	.	0.059	.	.	.	0.012	.	.	.	.	.	.	.	.	0.011	0.006	.

* SRM 89 also contains As₂O₃: 0.03, As₂O₅: 0.36, Cl: 0.05**CRM GLASS REFRACTIVE INDEX**

Number	High Wavelength	Refractive Index	Low Wavelength	Refractive Index	Certified Data Points	Units
SRM 1822	1082.97 nm	1.507143	404.66 nm	1.532710	15	5 x 12 x 17 mm last

RM GRAVEL

typical analysis listed in mass %

100 g units

Number	SiO ₂	Al ₂ O ₃	CO ₂	CaO	Co ₃ O ₄	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	MnO	Mn ₃ O ₄	Na ₂ O	P ₂ O ₅	S	SO ₃	TiO ₂	-H ₂ O 900°C
DH 3610	98.80	0.234	.	0.008	.	0.030	0.419	0.014	.	.	0.009	<0.003	.	0.009	.	.	0.153
DH 3609	96.35	1.46	<0.025	0.047	0.005	0.029	0.706	0.334	0.104	.	0.020	0.045	0.019	.	.	0.086	0.48
DH 3605	95.42	0.346	0.030	3.33	0.0002	0.020	0.346	0.070	0.079	0.018	.	0.012	0.008	.	0.013	0.044	0.043

continued analysis listed in mg/kg

listed in mg/kg

Number	BaO	C	CeO ₂	CuO	NiO	V ₂ O ₅	ZnO	ZrO ₂	La	Li	Sr
DH 3610	.	.	.	.	.	.	.	.	.	.	.
DH 3609	.	.	.	.	.	<0.006	.	.	.	.	.
DH 3605	0.003	0.020	0.0001	0.005	0.065	0.002	0.001	0.004	1.6	5.9	11.2

HARDGROVE GRINDABILITY INDEX

Class	Set Number	HGI	HGI	HGI	HGI	Units
CRM	NCS AG82001d-4d	sample 1d: 35	sample 2d: 56	sample 3d: 74	sample 4d: 107	250 g of each 1d - 4d
RM	ACIRS H2	sample A : 27	sample B : 47	sample C : 64	sample D : 89	2 kg of each A - D
RM	ACIRS H4	sample A : 30	sample B : 47	sample C : 64	sample D : 87	2 kg of each A - D

last of stock

CRM HARDNESS TEST BLOCKS

for NCS items, please indicate desired hardness when ordering

Number	Scale	Available Range	Units (mm)
NCS HBS	Brinell Hardness S	(8-650)	100 x 80 x 16
NCS HBW	Brinell Hardness W	(8-650)	100 x 80 x 16
NCS HL	Leeb Hardness	(200-900)	90 Ø x 55
NCS HLG	Leeb Type G Hardness	(300-750)	120 Ø x 70
NCS HRA	Rockwell Hardness A	(20-88)	60 x 40 x 10
NCS HRB	Rockwell Hardness B	(20-100)	60 x 40 x 10
BS TRM-3	Rockwell Hardness B	86.3	300 x 300 x ~2 17025
NCS HRC	Rockwell Hardness C	(20-70)	60 x 40 x 10
NCS HR15N	Rockwell Superficial Hardness 15N	(70-94)	60 x 40 x 10
NCS HR30N	Rockwell Superficial Hardness 30N	(42-86)	60 x 40 x 10
NCS HR45N	Rockwell Superficial Hardness 45N	(20-77)	60 x 40 x 10
BS TRM-4	Rockwell Superficial Hardness 15T	71.9	300 x 300 x ~2 17025
NCS HR15T	Rockwell Superficial Hardness 15T	(67-93)	60 x 40 x 10
NCS HR30T	Rockwell Superficial Hardness 30T	(29-82)	60 x 40 x 10
NCS HR45T	Rockwell Superficial Hardness 45T	(1-72)	60 x 40 x 10
NCS HSD	Shore Hardness	(5-105)	65 x 52 x 15
NCS HV	Vickers Hardness	(5-1000)	60 x 40 x 10
NCS HVM	Vickers Microhardness	(5-1000)	25 x 25 x 6

CRM INCINERATED WASTE

analysis listed in mg/kg

30 g powder

Number	As	Ba	Be	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Sb	Se	Sn	Sr	V	Zn
BL 12-1-12	45	3600	(8)	(60)	23	731	375	7.8	(10)	198	(1389)	(67)	4	(815)	(233)	(69)	10450

informational analysis listed in mass %

Number	Al ₂ O ₃	CO ₂	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	SiO ₂	TiO ₂
BL 12-1-12	(11.92)	(11.05)	(13.68)	(4.44)	(3.23)	(3.41)	(0.46)	(2.56)	(1.77)	(2.22)	(41.78)	(1.14)

CRM IMPACT

approximate analysis

Number	Energy	Uncertainty	Temperature	Units	Type
SRM 2098	176 - 244 J	8.8 - 12.2 J	21 'C +/- 1'	5 pcs of 10 mm x 10 mm x 55 mm	CHARPY v-notch
ERM-FA415	155.1 J	4.6 J	20 'C +/- 2'	5 pcs of 10 mm x 10 mm x 55 mm	CHARPY v-notch
ERM-FA016	122.0 J	3.6 J	20 'C +/- 2'	5 pcs of 10 mm x 10 mm x 55 mm	CHARPY v-notch
SRM 2097	101.9 J	0.572	-40 'C +/- 1'	5 pcs of 10 mm x 10 mm x 55 mm	CHARPY v-notch
SRM 2096	88 - 136 J	4.4 - 6.8 J	-40 'C +/- 1'	5 pcs of 10 mm x 10 mm x 55 mm	CHARPY v-notch
ERM-FA015	79.8 J	2.4 J	20 'C +/- 2'	5 pcs of 10 mm x 10 mm x 55 mm	CHARPY v-notch
ERM-FA013	28.1 J	0.8 J	20 'C +/- 2'	5 pcs of 10 mm x 10 mm x 55 mm	CHARPY v-notch
SRM 2093	15.4 J	0.125	-40 'C +/- 1'	5 pcs of 10 mm x 10 mm x 55 mm	CHARPY v-notch
SRM 2092	13 - 20 J	1.4 J	-40 'C +/- 1'	5 pcs of 10 mm x 10 mm x 55 mm	CHARPY v-notch
SRM 2115	13 - 25 J	1.4 J	21 'C +/- 1'	5 pcs of 10 mm x 10 mm x 75 mm	IZOD beam

CRM LAYER THICKNESS

BCR: 2 sets of 4 Tantalum foils, 5 mm x 10 mm NMIJ: 13-15 mm squares

Number	Material	Thickness	(+/-)	Layer 1	2	3	4	5	6	7	8
NMIJ 5202a	Si, SiO ₂ multi layer	n/a nm	0.7 nm	(20.5)	20.0	20.5	19.9	20.4	surface	oxide: (1.32)	
NMIJ 5203a	GaAs, AlAs multi layer	n/a nm	0.10 nm	(9.24)	9.65	9.51	9.64	9.51	9.62	.	.
NMIJ 5204b	GaAs, AlAs single layer	3.26 nm	0.41 nm	.	.	.	.	.	.	.	.
BCR 261T	Ta ₂ O ₅ single layer	1.72 nm	0.07 nm	30 nm material	.	.	.	.	.	.	.
BCR 261T	Ta ₂ O ₅ single layer	5.40 nm	0.12 nm	100 nm material	.	.	.	.	.	.	.

CRM NANOSCALE LAYER THICKNESS

Number	Certified Values	Informational Data	Units
BAM L200	35 certified lengths from 3.5 - 4642 nm	5 informational lengths 1 - 5 nm	block ~10 x 4 x 5 mm

CRM LEAD PAINT FILMS

sold in SET/6 only, thin paint film on polyester sheets last of stock ~7cm wide and ~10 cm long

Number	film, Pb in mg/kg		film, Pb in mg/kg		film, Pb in mg/kg		film, Pb in mg/kg		film, Pb in mg/kg		film, Pb in mg/kg		film, Pb in mg/kg	
SRM 2579a	2571	3.58	2572	1.527	2572	1.527	2573	1.040	2574	0.714	2575	0.307	2570	<0.001

RM ELECTROLYTIC MANGANESE

typical analysis

50 g units

Number	Al	C	Co	Cr	Cu	Fe	Mn	Ni	P	S	Si	Zn	-H ₂ O@900°C
DH 7701	(0.0015)	0.120	0.0012	0.411	0.0070	2.07	95.85	0.0068	0.056	0.0160	1.09	0.0011	0.019

CRM MANGANESE METAL POWDER

analysis listed in mass %

50 g units

Number	Mn	C	Fe	N	P	S	Se	Si
NCS HC25655	97.43	0.080	1.81	.	0.018	0.016	.	0.28
NCS HC15604	95.52	0.154	3.37	.	0.032	0.019	.	0.92
NCS HC26615	91.56	0.007	0.039	7.84	.	0.031	0.049	0.009

RM MELTING POINT

Number	Form	Melting point °C
501-951	6 inch nickel wire	1452
502-496	6 inch gold wire	1063

CRM OXIDE

analysis listed in mg/kg except % which is mass %

100 g units

Number	Notes	Ag	Al	As	B	Ba	Be	C	Ca	Cd	Ce	Cl	Co	Cr
BAM RS 1	SiO ₂ > 99.99%	.	8.7	<0.1	.	.	.	.	0.42	<0.05	.	.	.	0.062
BAM RS 2	Al ₂ O ₃ = 99.76%	.	.	(<0.5)	(<5)	.	(<0.2)	.	3.1	(<0.5)	(<0.1)	(<10)	<1	<1.5
BAM RS 5	NiO	<1	(<15)	<0.2	.	<1	.	14	2.2	<0.2	.	.	<2	16.1
BAM RS 6A	MgO 100 - 350 μm	.	46	.	.	(<10)	.	(<50)	994	.	.	.	(<5)	9.2
BAM RS 6B	MgO 50 - 100 μm	.	49	.	.	(<20)	.	(<210)	956	.	.	.	(<5)	8.1

continued

Number	Cu	Fe	Ga	Ge	Hg	In	K	La	Li	Mg	Mn	Mo	Na	Ni	Pb
BAM RS 1	<0.1	0.62	.	<1	<0.05	.	0.48	.	0.25	<0.5	<0.2	.	<2	<0.2	<0.15
BAM RS 2	<2.5	3.3	(<2)	.	.	(<0.5)	(<5)	(<0.3)	<1	<3	<1.5	(<1)	<15	<10	.
BAM RS 5	1.53	41	<0.5	.	.	<1	<2	.	(<2)	<1	<1	<5	<2	78.57%	<2
BAM RS 6A	(<6)	72	.	.	.	.	.	.	.	60.19%	5.4	(<10)	.	3.9	(<5)
BAM RS 6B	(<6)	71	.	.	.	.	.	.	.	60.17%	5.2	(<10)	.	3.3	(<5)

continued

Number	S	Sb	Se	Si	Sn	Sr	Te	Ti	Tl	V	W	Zn	Zr
BAM RS 1	.	.	.	<20	(<1)	.	.	1.3	.	.	.	<1.3	<0.1
BAM RS 2	.	.	.	<20	(<1)	.	.	<2	.	<1	.	<2	3.2
BAM RS 5	(4)	(<0.1)	<1	(<5)	(<1)	(<1)	(<0.2)	(<2)	(<0.5)	<1	(<1)	3.4	(<1)
BAM RS 6A	.	.	.	.	.	2.0	.	1.3	.	8.4	.	(<6)	(<20)
BAM RS 6B	.	.	.	.	.	2.1	.	1.2	.	7.8	.	(<6)	(<105)

RM OXIDES

analysis listed in mass %

continued analysis listed in mg/kg

100 g units

Number	CaO	CO ₂	MnO ₂	Mn ₃ O ₄	Al ₂ O ₃	BaO	C tot	CaO	Cl (H ₂ O)	Cl tot	CO ₂	Co ₃ O ₄	Cr ₂ O ₃	CuO
DH P0101	55.96	43.95	.	.	.	5.7	.	.	.	.	.	.	.	1.2
DH P0301	.	.	99.947	.	15.9	11.3	.	2.2	.	.	.	59.2	32.7	.
DH P0302	.	.	.	99.986	21	12.3	.	3.2	.	.	.	67.3	37.9	.
DH P0401	Iron Oxide	.	.	.	22.1	3.1	.	4.6	.	.	70.0	30.7	23.4	.
DH P0402	Iron Oxide	.	.	.	805	.	107	41	957	.	.	117	575	133
DH P0403	Iron Oxide	.	.	.	924	.	(113)	46	1360	1373	.	112	591	132

Number	Fe ₂ O ₃	K ₂ O	MgO	Mn ₃ O ₄	MoO ₃	Na ₂ O	NiO	P ₂ O ₅	SiO ₂	SO ₃	SrO	TiO ₂	WO ₃	ZnO	-H ₂ O(900°C)
DH P0101	5.6	.	165.7	.	.	78	.	.	(<20)	(100)	164	.	.	.	.
DH P0301	112.5	.	1.2	.	.	13.3	2	.	76.2	.	1.8	.	.	.	.
DH P0302	129.4	.	1.5	.	.	10.9	2.4	.	81.3	.	1.9	.	.	.	.
DH P0401	.	.	3.7	11.9	5.3	<7	.	2.9	.	16.5	0.12	.	12.6	9.5	173
DH P0402	.	12	12	3226	.	(27)	301	176	138	32	.	89	.	.	.
DH P0403	.	20	13	3522	.	(203)	301	195	376	62	.	87	.	.	.

RM HALFNIIUM DIOXIDE

analysis listed in mass

30 g units

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	MgO	SiO ₂	TiO ₂	ZrO ₂
OSO HFO-4-95	0.030	0.090	0.028	0.019	0.11	0.20	0.070
OSO HFO-3-95	0.015	0.056	0.016	(0.010)	0.046	0.11	1.03
OSO HFO-2-95	0.0045	0.012	0.0065	0.0031	0.013	0.021	0.44
OSO HFO-1-95	0.0030	0.0023	0.0045	0.0024	0.0035	0.0022	2.12

CRM IRON OXIDE

analysis listed in mass %

75 g units

Number	Fe ₂ O ₃	FeO	Al	C	Ca	Cr	Cu	K	Mg	Mn	Ni	S	Si	Other Impurities
VS P26/2	99.49	(<0.1)	0.026	(0.005)	(0.005)	0.0194	0.0090	(0.006)	(<0.005)	0.292	0.024	(0.04)	0.0110	(0.1)

CRM IRON OXIDE

Number	Total Iron	Al ₂ O ₃	CaO	Cl-	MnO	SiO ₂	SO ₄ ²⁻	Units
NCS HS41701-7	69.49	0.0030	0.017	0.233	0.212	0.0098	0.019	80 g last of stock

CRM IRON OXIDE

analysis listed in mass %

analysis listed in mg/kg

100 g units

Number	T.Fe	Cl	Mn	Al	Ca	Co	Cr	Cu	K	Mg	Mo	Na	Ni	P	Si	Sn	Ti	Zn
ECRM 686-1	69.44	0.095	0.231	407	97	19	182	38	24	27	7	58	127	78	83	25	14	4

CRM IRON OXIDE and SILICON OXIDE

analysis listed in mass % except * which is mg/kg

Number	SiO ₂	Si	Al ₂ O ₃	Al*	CaO	C	Cr*	Fe	MgO	Mg*	MnO	Mn*	Ni*	S*	TiO ₂	LOI	Units
IRSID 608-1	60.39	.	9.94	.	8.70	.	.	4.00	1.34	.	0.057	.	.	.	0.714	.	100 g
JSS 009-3 *	.	(<0.004)	.	(3)	.	(0.02)	9.7	69.84 (tot)	.	(0.3)	.	(0.6)	(0.3)	(1)	.	(0.4)	50 g

* JSS 009-3 contains (<0.0002) of As, Bi, Ca, Co, Cu, K, Na, P, Pb, Sn, Ti, V, and Zn.

CRM NICKEL OXIDE

certified analysis listed in mass % except * which is mg/kg

25 g units

Number	Al	Co	Cr	Cu	Fe	Mg	Mn	Si	Ti	Bi*	Pb*	Se*
SRM 673	0.001	0.016	0.0003	0.002	0.029	0.003	0.0037	0.006	0.003	0.06	3.5	0.2
SRM 672	0.004	0.55	0.003	0.018	0.079	0.020	0.095	0.11	0.009	0.3	38	0.40
SRM 671	0.009	0.31	0.025	0.20	0.39	0.030	0.13	0.047	0.024	0.07	16	2.0

continued informational analysis in mg/kg

Number	Ag	As	Cd	Ga	Sb	Sn	Te	Tl	Zn
SRM 673	<0.1	0.4	0.05	<0.1	<0.5	<0.5	0.4	<0.1	1.7
SRM 672	0.3	74, 45	1.7	0.4	0.5	4	<0.2	<0.1	140
SRM 671	0.5	59, 45	0.7	0.8	0.4	2.7	<0.2	<0.1	160

Certified values show concentrations in nickel oxide. To convert values to the percent concentration in total metal present, multiply the values by 1.28 for SRM 671 and 672; for SRM 673 multiply by 1.29.

Where Arsenic has two values, the first is atomic absorption and the second is photometric (extraction and distillation.)

CRM TITANIUM DIOXIDE SET

analysis listed in mass %

ONLY available in SET/8 x 20 g units

Number	Cr	Cu	Fe	Mn	Mo	Ni	Si	Sn	V
GSO 2158-81	0.0010	.	.	.	.	.	0.00054	0.00020	.
GSO 2159-81	0.00035	.	0.00055	.	.	0.00046	0.0010	.	.
GSO 2160-81	0.0013	0.0110	0.0010	0.090	.	0.0120	0.0015	0.0018	0.0014
GSO 2161-81	0.0013	0.0024	0.0023	0.0010	0.0130	0.0088	.	0.0028	.
GSO 2162-81	0.0023	0.0043	0.0180	0.0025	0.0048	0.0029	0.0130	0.0047	0.1800
GSO 2163-81	0.038	0.032	.	0.0180	.	0.0280	0.0030	.	0.0016
GSO 2164-81	.	.	0.0095	.	0.0110	.	0.0180	.	.
GSO 2165-81	.	0.0023	0.0082	0.0040	0.0017	0.0014	.	0.035	0.0040

CRM TITANIUM DIOXIDE

Number	TiO ₂	Uncertainty	Units
SRM 154c	99.591	+/- 0.062	90 g

CRM VANADIUM PENTOXIDE

analysis listed in mass %

NCS: 25-50 g units

SARM, VS: 100 g units

Number	V ₂ O ₅	V ₂ O ₄	V	Al ₂ O ₃	C	CaO	Fe	Fe ₂ O ₃	K	K ₂ O	Na	Na ₂ O	P	S	Si	SiO ₂	TiO ₂	Others
NCS HC26612a	98.99	.	.	.	.	.	0.078	.	.	0.12	.	0.58	0.022	(0.001)	0.080	.	.	As: (0.0008)
NCS HC26612	98.09	.	.	.	.	.	0.16	.	.	0.15	.	1.11	0.027	0.014	0.17	.	.	As: 0.016
NCS HC19611	98.80	.	.	.	Cr:0.018	.	0.061	.	.	0.14	.	1.03	0.010	0.011	0.102	.	.	As:(<0.001)
NCS HC19610	96.68	.	.	.	Cr:0.099	.	0.43	.	.	0.18	.	0.96	0.007	0.014	0.40	.	.	As:(<0.001)
SARM 38	95.52	3.07	55.84	0.14	.	.	.	0.119	.	0.600	.	0.22	.	(0.0045)	.	0.11	.	MgO: 0.0037
VS R30	94.3	.	.	.	0.007	0.88	0.51	.	0.053	.	0.032	.	0.0064	0.0072	.	0.43	0.21	MnO: 2.58

CRM ZINC OXIDE

Number	Zn	CaO	Cd	Cl	F	Fe	MgO	Pb	S	SiO ₂	Units
IMN TC9	53.4	6.96	0.0049	0.033	0.055	5.64	3.50	3.77	0.52	5.47	220 g

CRM PAPER

AVAILABLE IN SET/20 ONLY

includes software for data processing

5 pages per sample, 8.5 x 11" each

dry TAPPI analysis listed in mass %								Total	400°C	900°C	Base Weight
Number	CaCO ₃	Kaolin	TiO ₂	Talc	Muscovite	Al ₂ O ₃	P ₂ O ₅	Filler	Ash	Ash	g/m ²
A	9.88	0.28	0.00	1.41	0.00	.	.	11.57	11.88	7.32	75
B	18.20	0.28	0.00	0.00	0.00	.	.	18.48	18.53	10.65	75
C	12.53	0.56	0.00	0.60	0.00	.	.	13.69	13.58	8.11	75
D	18.29	0.00	0.00	0.00	0.00	.	.	18.29	18.76	10.51	75
E	9.45	0.00	0.00	0.00	0.00	.	.	9.45	10.14	5.78	75
F	11.22	0.00	0.39	0.60	0.00	.	.	12.21	12.34	7.49	75
G	12.26	0.18	0.00	0.41	0.00	.	.	12.85	13.08	7.56	75
H	11.19	1.34	0.00	0.38	0.00	.	.	12.91	11.98	8.01	75
I	18.94	0.00	0.00	0.28	0.00	.	.	19.22	19.71	11.11	80
J	14.79	0.51	0.09	1.48	0.00	.	.	16.87	17.11	10.65	75
K	14.12	2.10	0.28	1.88	0.00	.	.	18.38	18.30	12.17	75
L	0.00	7.54	1.75	0.00	0.00	.	.	9.29	8.81	8.38	75
M	0.16	10.91	0.18	0.00	0.00	.	.	11.25	11.16	10.12	75
N	1.74	0.00	1.51	10.74	0.00	.	.	13.99	14.70	13.28	75
O	1.86	12.69	0.00	0.47	7.57	.	.	22.59	22.99	20.34	80
P	25.81	0.35	0.00	0.00	0.00	.	.	25.96	26.93	15.61	105
Q	0.00	0.30	38.60	0.00	0.00	2.70	1.87	43.47	43.39	43.13	85
R	0.13	19.02	0.25	0.00	0.65	.	.	20.05	20.21	17.56	45
S	0.14	32.04	0.42	0.00	1.08	.	.	33.68	33.57	29.43	60
BLANK	0.00	0.00	0.00	0.00	0.00	.	.	0.02	0.02	0.01	75

CRM PARTICLE SIZE and MASS VOLUME in ALUMINA

Number	Permeametry	BET Absorption	Obligatory Porosity	Size Range	Median Size
TL AA	2,300 cm ² /g	5,000 cm ² /g	0.57	1-64 µm	12.7 µm
TL AB	10,300 cm ² /g	31,000 cm ² /g	0.67	1-31.50 µm	2.1 µm

CRM		PARTICLE SIZE			analysis listed in μm
Number	Weight Percentile	Certified Value	Uncertainty	Units	
SRM 659	10	0.48	0.10	5 x 2.5 g powder	
	25	0.81	0.10		
	50	1.43	0.10		
	75	2.08	0.11		
	90	2.80	0.13		
SRM 1018b	1.2 - 98.1	220 - 750	0.4 - 2.0	87 g of 0.2 g glass beads	

CRM		PARTICLE SIZE		
Number	Average Diameter, μm	Uncertainty, μm	Material	Units
SRM 1691	0.269	± 0.007	Polystyrene Spheres	5 mL

CRM		PARTICLE SIZE		
Number	Quartz Form	Certified Property	Size Range in Microns	Unit Size
BCR 066	Powder	Stokes' diameter	0.35 - 3.50	10 g
BCR 070	Powder	Stokes' diameter	1.2 - 20	10 g
BCR 067	Powder	Stokes' diameter	2.4 - 32	10 g
BCR 069	Powder	Stokes' diameter	14 - 90	10 g
BCR 130	Powder	Volume diameter	50 - 220	50 g
BCR 068	Sand	Volume diameter	160 - 630	100 g
BCR 131	Powder	Volume diameter	480 - 1800	200 g
BCR 132	Gravel	Volume diameter	1400 - 5000	700 g

CRM		PARTICLE SIZE		
Number	Percentage of Particles Under 20 Microns	Standard Deviation	Uncertainty @ 95% CL	Units
ASCRM 026	1.0	± 0.1	± 0.2	210 g

CRM		PARTICLE DENSITY, SURFACE AREA, AND SIZE DISTRIBUTION			
Number	Particle Density Picnometer Method	Blaine Area With EN 196-6	Particle Size by Laser Diffraction ISO 13320-1	Air Jet Seiving Alpine Test NF X11-640	Units
TL 18Ga	3.11 g/cm ³	3396 cm ³ /g	11.4% @ 2.0 μm - 99.9% @ 160 μm	71.4% @ 31.5 μm - 100% @ 160 μm	40 g

CRM		pH STANDARDS		
Number	PH	Accreditation	Units	
TL pH9	9.180	ISO GUIDE 34	10 x 25 mL or as a SET/15 bottles = 5 x pH4, 5 x pH7, 5 x pH9	
TL pH7	6.865	ISO GUIDE 34		
TL pH4	4.005	ISO GUIDE 34		

RM	PLASTER					analysis listed in mass %					100 g units		
Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	P ₂ O ₅	SO ₃	SiO ₂	SrO	TiO ₂	LOI	
BCS 202A	0.33	37.4	0.10	0.10	0.39	<0.03	<0.01	53	1.38	0.33	0.03	7.0	

RM	PLASTIC					analysis listed in mass %						50 g pellets		
Number	Al	Ca	Cl	Cr	F	Fe	Mg	Na	P	S	Si	Ti	Zn	
JSM P702-1	0.0012	0.0013	(0.0017)	0.0012	.	0.0015	0.0015	0.0012	0.0011	(0.0014)	(0.0008)	0.0009	0.0010	
JSM P703-1	0.022	0.023	(0.018)	0.020	(0.018)	0.021	0.029	0.024	0.017	(0.021)	0.018	0.017	0.020	

CRM		POROUS MATERIAL			
Number	Description	Units	Specific Pore Volume	Median Pore Diameter	Density
BAM P 128	Alumina Ceramic	6 Cylinders 7 g total	220 mm3/g	27.6 μm	(3.6405) g/cm3

CRM POROUS MATERIALS and SURFACE AREA

Number	Description	Units	A _{BET} (m ² /g) BET Specific Surface Area	V _D (cm ³ /g) Specific Pore Volume	D ₁ (nm) Hydraulic Pore Diameter	D ₂ (nm) Most Frequent Pore Diameter	D ₃ (nm) Most Frequent Pore Diameter	(nm) Median Pore Width
BAM P 109	Activated Carbon	10g	1396	.	.	.	.	.
BAM P 108	Activated Carbon	10g	550	.	.	.	.	.
BAM P 106	Titanium Dioxide	15g	96.6	0.2341	9.69	8.2	11.5	.
BAM FD107	Faujasite Zeolite	10g	.	0.217 cm ³ /g ⁻¹	.	.	.	0.86

Number	Description	Units	(nm) Mean Pore Radius	(nm) Most Frequent Pore Radius	(cm ² /g) Specific Surface Area	(mm ³ /g) Pore Volume 100 Mpa	(mm ³ /g) Pore Volume 195 Mpa	(mm ³ /g) Pore Volume 200 Mpa	(mm ³ /g) Pore Volume 395 Mpa
BAM PM 101	SiO ₂	10g	.	.	0.177	.	.	.	.
BAM PM 102	Alpha-Al ₂ O ₃	10g	.	.	5.41	.	.	.	.
BAM FD 120	Alpha-Al ₂ O ₃	10g	228.0	232.2	.	545.0	546.7	546.8	548.1
BAM FD 121	Porous glass	12g	15.1	15.3	.	621.8	621.9	621.9	624.6
BAM FD 122	Porous glass	15g	139.0	140.2	.	919.7	922.5	922.6	924.4

ROHS/WEEE SAMPLES

= class, where 1 = CRM and 2 = RM analysis listed in mass % * ERM EC680K also contains 0.0102% Cl and 0.0076% S

#	Type	Units	Number	As	Br	Cd	Cr	Hg	Pb	Se	Sold As
1	ABS resin	pellets 25 g	NMIJ 8112a	.	.	0.000938	0.009447	0.009410	0.009498	.	individually
1	ABS resin	granules 100g	BAM H010 gran	.	0.0240	0.0093	0.0470	(0.0415)	0.0479	.	individually
1	ABS resin	40 mm Ø x 1 mm	BAM H010 1mm	.	0.0240	0.0093	0.0470	(0.0415)	0.0479	.	individually
1	ABS resin	40 mm Ø x 2 mm	BAM H010 2mm	.	0.0240	0.0093	0.0470	(0.0415)	0.0479	.	individually
1	ABS resin	40 mm Ø x 6 mm	BAM H010 6mm	.	0.0240	0.0093	0.0470	(0.0415)	0.0479	.	individually
1	ABS resin	40 mm Ø x 1-6 mm	BAM H010 set	.	0.0240	0.0093	0.0470	(0.0415)	0.0479	.	set of above 3 discs
1	ABS resin	30 mm Ø x 2 mm	NMIJ 8105a	.	.	0.001070	0.002751	.	0.010828	.	individually
1	plastic	40 mm Ø x 4 mm	JSAC 0631	.	.	0.00225	0.00258	0.00197	0.00245	.	set only
1	plastic	40 mm Ø x 4 mm	JSAC 0632	.	.	0.00461	0.00933	0.00594	0.00929	.	
1	polyester	chips 50 g	JSAC 0602-3	.	.	0.00506	0.01125	0.00121	0.01121	.	individually
1	polyester	chips 50 g	JSAC 0601-3	.	.	0.00050	0.0113	0.000130	0.00121	.	individually
1	low density polyethylene	pellets 100 g	ERM EC680K *	0.00041	0.0096	0.00196	0.00202	0.000464	0.00136	.	individually
2	low density polyethylene	48 mm Ø x 5 mm	SCAS PE-5E6 1	.	0	0	0	0	0	.	set only
2	low density polyethylene	48 mm Ø x 5 mm	SCAS PE-5E6 2	.	0.1300	0.0029	0.0053	0.0053	0.0058	.	
2	low density polyethylene	48 mm Ø x 5 mm	SCAS PE-5E6 3	.	0.0670	0.0059	0.0110	0.0110	0.0120	.	
2	low density polyethylene	48 mm Ø x 5 mm	SCAS PE-5E6 4	.	0.0310	0.0089	0.0320	0.1200	0.0360	.	
2	low density polyethylene	48 mm Ø x 5 mm	SCAS PE-5E6 5	.	0.0110	0.0120	0.0660	0.0620	0.0730	.	
2	low density polyethylene	48 mm Ø x 5 mm	SCAS PE-5E6 6	.	0.0053	0.0350	0.1300	0.0290	0.1400	.	
2	polyethylene	31 mm Ø x 12 mm	PE High	.	0.1100	0.0300	0.1003	0.1100	0.1199	.	set only
2	polyethylene	31 mm Ø x 12 mm	PE Low	.	0.0500	0.0100	0.0400	0.0200	0.0403	.	
2	polyethylene	31 mm Ø x 12 mm	PE Blank	.	0	0	0	0	0	.	
2	polyethylene packaging	31 mm Ø x 12 mm	PACK High	.	.	0.0100	0.0101	0.0100	0.0101	.	set only
2	polyethylene packaging	31 mm Ø x 12 mm	PACK Low	.	.	0.0060	0.0031	0.0031	0.0031	.	
2	polyethylene packaging	31 mm Ø x 12 mm	PACK Blank	.	.	0	0	0	0	.	
1	polypropylene resin	30 mm Ø x 2 mm	NMIJ 8136a	.	.	0.00937	0.08906	0.0952	0.09435	.	individually
1	PVC resin	pellets 25 g	NMIJ 8123a	.	.	0.009562	0.09490	0.09370	0.09655	.	individually
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0611	.	.	0.00000	0.00000	.	0.00000	.	set only
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0612	.	.	0.00086	0.00243	.	0.00242	.	
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0613	.	.	0.00219	0.00488	.	0.00485	.	
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0614	.	.	0.00430	0.00966	.	0.00959	.	
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0615	.	.	0.00866	0.01941	.	0.01929	.	
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0621	.	.	.	.	(<0.0001)	.	.	set only
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0622	.	.	.	.	0.00100	.	.	
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0623	.	.	.	.	0.00490	.	.	
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0624	.	.	.	.	0.01211	.	.	
1	polyvinyl chloride	40 mm Ø x 4 mm	JSAC 0625	.	.	.	.	0.0244	.	.	
2	polyvinyl chloride	31 mm Ø x 12 mm	PVC High	.	0.1101	0.0300	0.1001	0.1101	0.1201	.	set only
2	polyvinyl chloride	31 mm Ø x 12 mm	PVC Low	.	0.0500	0.0100	0.0400	0.0200	0.0400	.	
2	polyvinyl chloride	31 mm Ø x 12 mm	PVC Blank	.	0	0	0	0	0	.	
2	polyvinyl chloride	48 mm Ø x 5 mm	SCAS PVC-5E6 1	.	0	0	0	0	0	.	set only
2	polyvinyl chloride	48 mm Ø x 5 mm	SCAS PVC-5E6 2	.	0.1100	0.0026	0.0049	0.0061	0.0053	.	
2	polyvinyl chloride	48 mm Ø x 5 mm	SCAS PVC-5E6 3	.	0.0570	0.0050	0.0094	0.0110	0.0110	.	
2	polyvinyl chloride	48 mm Ø x 5 mm	SCAS PVC-5E6 4	.	0.0270	0.0078	0.0290	0.1200	0.0310	.	
2	polyvinyl chloride	48 mm Ø x 5 mm	SCAS PVC-5E6 5	.	0.0094	0.0110	0.0600	0.0610	0.0630	.	
2	polyvinyl chloride	48 mm Ø x 5 mm	SCAS PVC-5E6 6	.	0.0052	0.0320	0.1200	0.0310	0.1300	.	
1	soil	powder 50 g	JSAC 0403	0.0199	.	0.0183	0.0257	0.00111	0.0224	.	individually
1	soil	powder 50 g	JSAC 0402	0.00416	.	0.00185	0.00905	0.00013	0.00452	.	individually
1	soil	powder 25 g	JSAC 0466	0.01093	.	0.01199	0.1483	0.01135	0.1214	0.1175	set only
1	soil	powder 25 g	JSAC 0465	0.0550	.	0.06074	0.0738	0.00578	0.6124	0.0587	
1	soil	powder 25 g	JSAC 0464	0.02711	.	0.03010	0.0499	0.00286	0.03027	0.02919	
1	soil	powder 25 g	JSAC 0463	0.01376	.	0.01468	0.0244	0.001476	0.01516	0.01415	
1	soil	powder 25 g	JSAC 0462	0.00715	.	0.00742	0.01496	0.000727	0.00737	0.00716	
1	soil	powder 25 g	JSAC 0461	0.002153	.	(0.000030)	0.00972	0.0000075	0.00244	(0.000044)	
1	zinc	50 mm Ø x 20 mm	41X ZSC6A	.	.	0.215	<0.0002	0.029	0.0077	.	individually
1	zinc	50 mm Ø x 20 mm	41X ZSC3A	.	.	0.119	0.0148	0.0021	0.0273	.	
1	zinc	50 mm Ø x 20 mm	41X ZSC1A	.	.	0.0288	0.0039	0.026	0.06	.	
1	zinc	50 mm Ø x 20 mm	41X ZSC4B	.	.	0.0131	0.0299	0.050	0.156	.	
1	zinc	50 mm Ø x 20 mm	41X ZSC2A	.	.	0.0016	0.0036	0.0053	0.111	.	

#	Type	Units	Number	As	Br	Cd	Cr	Hg	Pb	Se	Sold As
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REFRACTORIES

= class, where 1 = CRM and 2 = RM

T = Total

IPT: 80 g

VS K6: 75 g

VS K10: 125 g

all others: 100 g

#	Number	SiO ₂	Al ₂ O ₃	C	CO ₂	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Mn ₃ O ₄	Na ₂ O	P ₂ O ₅	S	SO ₃	TiO ₂	ZrO ₂	LOI
1	IPT 63	96.28	0.48	.	.	2.21	0.52	0.043	0.18	0.008	.	0.013	0.013	.	.	0.030	(0.002)	0.17
2	DH 2611	60.07	36.82	0.033 T	.	0.054	0.509	0.362	0.170	0.011	.	0.055	0.036	.	0.014	1.50	0.047	0.186
1	ASMW FF8	53.79	36.91	.	.	0.36	2.93	1.69	0.54	.	.	0.09	.	.	.	2.54	.	.
2	FQZ 2610	43.75	40.21	0.020 T	0.008	11.55	0.94	1.44	0.39	.	0.025	0.141	0.051	<0.001	.	1.01	0.049	0.124
2	DH 2612	40.80	36.45	0.437	0.54	1.80	3.10	0.759	13.13	0.125	.	0.242	0.279	0.034	.	1.25	0.163	0.75
2	DH 2602	34.49	62.82	.	0.004	0.438	1.087	0.24	0.161	.	0.019	.	0.029	.	0.031	0.288	.	0.101
2	DH 2613	25.83	42.78	1.779	0.53	2.31	2.57	0.404	21.03	.	0.122	0.118	0.122	0.066	.	1.199	.	.
2	DH 2609	23.41	63.82	0.739 T	0.170	2.25	1.75	0.526	4.17	0.282	.	0.220	0.339	.	0.121	1.27	0.097	.
1	FLX CRM112	12.16	79.81	.	.	0.147	0.326	0.090	0.755	.	0.024	0.267	0.074	.	(0.04)	0.273	5.95	(5.42)
1	VS K6/4	2.12	0.54	(0.05)	.	2.95	2.26	.	92.4	.	.	.	.	.	.	.	.	.
1	VS K10/3	(0.2)	97	.	.	(0.03)	1.82	(0.03)	.	.	.	(0.5)	.	.	.	0.35	.	.

continued

Number	Co ₃ O ₄	CuO	Cr ₂ O ₃	HfO ₂	Li ₂ O	NiO	V ₂ O ₅	WO ₃	Units
IPT 63	.	.	.	.	(0.0005)	.	.	.	80 g
DH 2611	.	.	.	.	.	.	.	.	100 g
ASMW FF8	.	.	.	.	.	.	.	.	100 g
FQZ 2610	.	.	.	.	.	.	.	.	100 g
DH 2612	.	.	0.385	.	.	0.032	0.027	.	100 g
DH 2602	.	.	.	.	.	.	.	.	100 g
DH 2613	.	0.004	0.140	.	.	.	0.020	.	100 g
DH 2609	.	.	.	.	.	.	.	.	100 g
FLX CRM112	<0.01	.	0.017	0.099	.	<0.01	.	0.041	80 g
VS K6/4	.	.	.	.	.	.	.	.	75 g
VS K10/3	.	.	.	.	.	.	.	.	125 g

CRM ALUMINA REFRACTORY SET

SOLD IN SET/10 ONLY

20 g units

Number	Al ₂ O ₃	SiO ₂	B ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	TiO ₂
JRRM 310	94.7	0.41	.	0.03	0.02	1.32	0.97	0.04	0.08	2.06
JRRM 309	89.8	2.12	.	1.02	1.27	0.92	0.28	0.00	0.42	3.85
JRRM 308	86.5	10.2	.	0.09	0.41	0.10	0.05	0.11	0.26	1.79
JRRM 307	80.1	10.8	.	0.15	2.97	2.36	0.61	0.01	1.08	1.22
JRRM 306	74.1	17.3	.	0.62	1.95	1.75	0.10	0.01	0.99	2.68
JRRM 305	68.6	20.0	.	0.65	2.81	3.11	0.30	0.01	0.80	3.30
JRRM 304	63.0	27.5	.	0.18	3.46	0.38	0.37	0.05	0.27	4.34
JRRM 303	59.2	36.1	.	1.03	1.47	0.20	0.85	0.00	0.69	0.16
JRRM 302	53.9	37.7	.	0.87	4.49	0.66	0.69	0.20	0.56	0.59
JRRM 301	46.8	43.9	(0.87)	0.79	3.52	2.00	0.69	0.01	0.17	1.03

CRM ALUMINA-MAGNESIA REFRACTORY SET

SOLD IN SET/10 ONLY

certified values

20 g units

informational values

Number	Al ₂ O ₃	MgO	CaO	Fe ₂ O ₃	K ₂ O	Na ₂ O	P ₂ O ₅	SiO ₂	TiO ₂	Cr ₂ O ₃	MnO	ZrO ₂	LOI
JRRM 801	93.49	3.26	0.14	2.00	0.01	0.19	0.00	0.35	0.21	0.00	0.00	0.00	0.14
JRRM 802	84.25	6.13	2.00	1.03	0.46	0.15	0.95	3.32	1.48	0.00	0.00	0.00	0.06
JRRM 803	74.23	16.20	0.57	4.90	0.00	0.86	0.01	0.58	2.51	0.00	0.00	0.00	0.36
JRRM 804	64.66	20.84	4.76	4.02	0.04	0.08	0.11	5.17	0.13	0.01	0.02	0.00	0.01
JRRM 805	58.03	36.04	0.28	0.73	0.01	0.54	0.68	2.49	1.05	0.00	0.00	0.00	0.17
JRRM 806	48.85	49.43	0.97	0.16	0.00	0.04	0.04	0.51	0.00	0.00	0.02	0.00	0.21
JRRM 807	39.96	55.07	2.75	0.32	0.15	0.32	0.53	0.58	0.19	0.00	0.00	0.00	0.57
JRRM 808	28.68	67.01	0.99	0.56	0.69	0.40	0.22	0.79	0.71	0.00	0.01	0.00	0.84
JRRM 809	19.86	70.11	4.47	0.11	0.98	0.04	1.06	0.36	2.88	0.00	0.00	0.00	0.48
JRRM 810	10.08	78.96	0.18	3.11	0.16	0.75	0.51	4.21	1.91	0.00	0.01	0.00	0.22

CRM ALUMINA-ZIRCONIA-SILICA REFRACTORY SET

SOLD IN SET/10 ONLY

certified values

20 g units

informational values

Number	Al ₂ O ₃	ZrO ₂	SiO ₂	CaO	Cr ₂ O ₃	Fe ₂ O ₃	HfO ₂	K ₂ O	MgO	Na ₂ O	TiO ₂	MnO	P ₂ O ₅	LOI
JRRM 710	82.29	2.96	5.62	0.22	1.02	1.15	1.51	0.63	0.04	1.41	3.00	0.00	0.04	0.09
JRRM 708	79.52	12.84	0.54	1.17	0.29	0.80	1.03	0.74	1.64	0.08	1.02	0.00	0.00	0.13
JRRM 705	64.14	27.96	1.99	0.19	2.01	0.14	0.48	0.01	0.46	0.30	2.02	0.00	0.01	0.16
JRRM 707	55.78	18.16	21.17	1.08	0.18	1.81	0.36	0.15	0.84	0.19	0.28	0.00	0.05	0.01
JRRM 709	50.35	8.32	34.38	0.52	2.91	0.47	0.18	0.21	1.20	1.03	0.09	0.00	0.00	0.20
JRRM 703	46.34	37.35	14.64	0.03	0.00	0.05	0.72	0.00	0.01	0.53	0.07	0.00	0.03	0.09
JRRM 702	38.14	42.54	9.99	1.55	0.11	0.37	2.08	0.57	1.97	2.02	0.21	0.00	0.02	0.18
JRRM 706	25.95	22.72	39.33	1.58	0.01	0.13	1.19	0.95	0.15	3.49	3.77	0.00	0.01	0.72
JRRM 704	19.58	33.46	42.61	0.15	0.51	0.55	0.68	1.40	0.51	0.22	1.02	0.08	0.13	0.07
JRRM 701	10.09	48.06	28.44	2.07	1.01	2.00	0.85	0.02	0.47	1.84	4.96	0.00	0.02	0.09

CRM BURNT REFRACTORIES

IPT: 80 g units SRM: 75 g units

Number	Al ₂ O ₃	SiO ₂	CaO	Fe ₂ O ₃	K ₂ O	Li ₂ O	MgO	Na ₂ O	P ₂ O ₅	SrO	TiO ₂	ZrO ₂	LOI
SRM 78a	71.7	19.4	0.11	1.2	1.22	0.12	0.70	0.078	1.3	0.25	3.22	.	(0.42)
IPT 57	71.5	24.3	0.05	1.25	0.83	0.008	0.13	0.35	0.054	0.009	1.19	0.20	0.20
SRM 77a	60.2	35.0	0.05	1.00	0.090	0.025	0.38	0.037	0.092	0.009	2.66	.	(0.22)
IPT 51	40.3	55.0	0.06	1.19	0.69	0.018	0.20	0.09	0.09	.	2.19	0.070	0.16
SRM 76a	38.7	54.9	0.22	1.60	1.33	0.042	0.52	0.07	0.120	0.037	2.03	.	(0.34)

CRM CHROME-MAGNESIA REFRACTORY SET

SOLD IN SET/12 ONLY

certified values

informational values

20 g units

Number	MgO	Cr ₂ O ₃	Al ₂ O ₃	CaO	Fe ₂ O ₃	MnO	SiO ₂	TiO ₂	NiO	P ₂ O ₅	V ₂ O ₅	ZnO	LOI
JRRM 501	87.60	2.82	2.92	0.92	4.80	0.02	0.92	0.00	0.01	0.03	0.01	0.00	0.13
JRRM 502	76.28	7.49	11.98	0.20	1.02	0.01	3.11	0.01	0.02	0.02	0.02	0.00	0.06
JRRM 503	63.11	13.60	7.14	3.81	3.00	0.03	9.09	0.04	0.03	0.03	0.03	0.01	0.11
JRRM 504	54.85	18.35	17.56	2.60	4.11	0.01	2.18	0.01	0.01	0.03	0.01	0.01	0.12
JRRM 505	50.14	21.74	7.76	0.49	17.76	0.10	1.82	0.11	0.07	0.02	0.07	0.02	0.08
JRRM 506	46.65	28.19	14.69	0.46	7.49	0.07	2.16	0.13	0.09	0.01	0.08	0.01	0.07
JRRM 508	30.86	38.18	3.98	1.03	22.70	0.00	3.08	0.01	0.01	0.01	0.00	0.00	0.05
JRRM 512	24.81	4.98	29.25	4.06	26.01	0.02	10.57	0.04	0.01	0.01	0.01	0.01	0.02
JRRM 507	22.36	32.03	25.02	1.61	12.98	0.11	5.69	0.16	0.20	0.01	0.13	0.03	-0.11
JRRM 509	20.45	42.57	20.28	2.86	10.15	0.08	1.96	1.20	0.04	0.01	0.11	0.03	0.13
JRRM 510	16.86	50.38	12.21	0.29	14.99	0.17	4.91	0.13	0.19	0.01	0.11	0.04	-0.25
JRRM 511	10.62	52.51	6.68	0.07	27.22	0.12	2.90	0.10	0.10	0.00	0.05	0.05	-0.48

CRM FIRECLAY REFRACTORY SET

SOLD IN SET/10 ONLY

20 g units

Number	SiO ₂	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	TiO ₂
JRRM 101	88.57	8.10	1.06	0.31	0.16	0.21	0.11	1.01	0.30
JRRM 102	80.47	13.79	0.04	3.97	0.14	0.67	0.01	0.30	0.45
JRRM 103	80.32	18.07	0.07	0.40	0.35	0.01	0.00	0.12	0.37
JRRM 104	67.35	22.52	0.25	3.24	3.04	0.07	0.01	0.30	2.94
JRRM 105a	69.17	25.35	0.40	0.76	0.81	0.22	0.11	0.65	2.24
JRRM 106	63.61	29.91	0.14	1.92	1.81	0.98	0.02	0.59	0.67
JRRM 107	55.32	37.08	0.71	2.20	2.57	0.49	0.01	0.21	1.15
JRRM 108	55.31	40.08	0.27	1.54	0.80	0.27	0.02	0.20	1.05
JRRM 109	54.23	41.24	0.14	0.89	0.79	0.12	0.01	0.30	1.96
JRRM 110	49.54	46.68	0.10	0.84	0.34	0.16	0.01	0.08	1.66

CRM FIRECLAY REFRACTORY SET

SOLD IN SET/15 ONLY

20 g units

Number	SiO ₂	Al ₂ O ₃	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	TiO ₂	ZrO ₂	LOI
JRRM 121	86.3	6.07	1.96	0.01	0.40	0.23	0.12	0.02	3.20	0.32	0.05	1.11	(0.05)
JRRM 125	79.2	18.7	0.13	0.01	0.50	0.69	0.08	0.00	0.07	0.04	0.30	0.02	(0.07)
JRRM 123	79.1	13.3	0.13	0.01	4.13	0.10	1.32	0.01	0.29	0.80	0.45	0.00	(0.03)
JRRM 122	78.2	10.2	0.43	0.81	0.24	2.05	0.65	0.20	1.04	4.89	1.03	0.20	(0.12)
JRRM 124	73.9	16.5	1.09	0.11	2.60	1.79	0.10	0.24	0.31	0.19	2.74	0.11	(0.10)
JRRM 127	68.5	23.0	0.18	0.27	0.92	0.54	0.15	0.17	1.75	1.78	2.19	0.04	(0.07)
JRRM 126	66.9	21.3	0.45	0.65	3.34	3.13	0.12	0.03	0.28	0.49	2.84	0.04	(0.17)
JRRM 129	62.2	30.1	0.15	0.10	1.46	1.92	2.23	0.01	0.23	0.20	0.96	0.11	(0.11)
JRRM 128	54.3	26.0	2.80	0.85	4.45	1.84	3.10	0.24	0.37	3.36	1.37	1.01	(0.02)
JRRM 130	53.4	32.7	1.95	1.05	0.53	1.42	0.61	0.37	2.32	0.91	3.35	0.83	(0.11)
JRRM 131	52.7	36.6	0.78	0.07	2.20	2.61	1.02	0.03	0.76	1.61	1.16	0.26	(0.17)
JRRM 132	50.6	39.1	1.29	0.11	1.64	0.79	0.34	0.11	2.16	2.38	0.29	0.75	(0.15)
JRRM 133	50.1	39.0	0.10	1.27	3.69	0.91	2.03	0.01	0.33	0.34	1.93	0.57	(0.08)
JRRM 134	47.2	44.3	0.20	0.24	1.07	0.37	0.20	0.24	0.13	3.83	1.74	0.35	(0.14)
JRRM 135	37.2	48.9	2.36	0.42	3.05	2.77	1.24	0.04	2.87	0.48	0.07	0.20	(0.18)

CRM MAGNESIA REFRACTORY SET

SOLD IN SET/10 ONLY						informational values								20 g units	
Number	MgO	Al ₂ O ₃	CaO	Fe ₂ O ₃	SiO ₂	B ₂ O ₃	Cr ₂ O ₃	K ₂ O	MnO	Na ₂ O	P ₂ O ₅	TiO ₂			
JRRM 410	99.08	0.05	0.59	0.05	0.18	0.02	0.00	0.00	0.01	0.00	0.04	0.00			
JRRM 409	98.03	0.20	0.74	0.49	0.53	0.03	0.01	0.00	0.01	0.00	0.02	0.00			
JRRM 408	96.19	2.55	0.67	0.13	0.46	0.09	0.00	0.00	0.01	0.00	0.01	0.00			
JRRM 407	94.55	0.10	0.67	2.14	2.43	0.02	0.08	0.00	0.01	0.00	0.04	0.00			
JRRM 405	91.95	1.37	1.69	1.34	3.47	0.01	0.01	0.01	0.07	0.00	0.12	0.05			
JRRM 406	91.85	1.13	4.80	0.87	1.19	0.01	0.00	0.00	0.01	0.00	0.04	0.00			
JRRM 404	88.02	6.01	1.78	2.90	1.22	0.01	0.00	0.00	0.03	0.00	0.05	0.00			
JRRM 403	85.48	4.06	0.61	1.55	8.14	0.03	0.01	0.00	0.01	0.00	0.04	0.00			
JRRM 402	83.77	1.99	3.57	5.05	5.46	0.12	0.00	0.00	0.01	0.01	0.07	0.02			
JRRM 401	81.24	8.10	0.20	3.89	6.42	0.01	0.00	0.00	0.01	0.00	0.03	0.01			

CRM SILICA REFRACTORY SET

SOLD IN SET/10 ONLY						20 g units				
Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	SiO ₂	TiO ₂	
JRRM 201a	10.03	2.77	1.56	0.27	0.68	0.15	0.46	83.8	0.04	
JRRM 202	7.60	0.81	3.97	0.02	0.02	0.00	1.01	85.8	0.56	
JRRM 203	5.10	3.98	1.78	0.24	0.47	0.11	0.61	87.4	0.18	
JRRM 204	4.50	1.79	2.08	0.94	0.31	0.10	0.31	89.7	0.15	
JRRM 205a	3.23	3.18	1.27	0.63	0.13	0.07	0.91	89.9	0.42	
JRRM 206	1.77	1.20	3.20	0.53	0.07	0.01	0.18	92.9	0.01	
JRRM 207	1.70	2.52	0.96	0.22	0.16	0.04	0.04	94.1	0.07	
JRRM 208	0.46	4.20	0.06	0.01	0.05	0.00	0.63	94.5	0.00	
JRRM 209	0.87	1.89	0.37	0.18	0.10	0.06	0.03	96.3	0.05	
JRRM 210	0.16	0.30	0.83	0.00	0.78	0.00	0.02	97.8	0.00	

CRM SILICON CARBIDE REFRACTORY SET available in SET/9 ONLY 50 g

Number	SiC	Tot C	Free C	LOI	Al	Ca	Fe	Mg	N	O	Ti	Free Si
JRRM 1001	99.58	29.81	0.04	.	0.008	<0.001	0.044	<0.001	0.030	0.048	0.0035	0.06
JRRM 1002	0.06	5.03	4.98	5.11	.	.	.	.	.	.	.	.
JRRM 1003	.	10.06	10.01	10.11	.	.	.	.	.	.	.	.
JRRM 1004	.	20.04	19.92	20.01	.	.	.	.	.	.	.	.
JRRM 1005	.	29.93	29.81	29.95	.	.	.	.	.	.	.	.
JRRM 1006	.	49.99	49.97	49.95	.	.	.	.	.	.	.	.
JRRM 1007	89.29	36.75	10.01	.	.	.	.	.	.	.	.	.
JRRM 1008	29.74	14.12	5.21	.	.	.	.	.	.	.	.	.
JRRM 1009	6.18	39.43	37.67	.	.	.	.	.	.	.	.	.

CRM ZIRCON-ZIRCONIA REFRACTORY SET

SOLD IN SET/10 ONLY						20 g units								
Number	ZrO ₂	HfO ₂	SiO ₂	Al ₂ O ₃	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	P ₂ O ₅	TiO ₂		
JRRM 601	92.0	1.59	0.26	0.11	5.58	0.00	0.10	0.00	0.06	0.00	0.00	0.16		
JRRM 602	88.4	1.52	0.33	0.07	0.22	0.01	1.62	0.00	5.30	0.76	1.34	0.16		
JRRM 603	84.8	1.45	0.96	5.29	0.95	0.02	2.86	0.65	0.96	0.18	0.83	0.93		
JRRM 604	79.4	1.35	3.05	6.93	0.09	3.06	0.43	1.94	0.01	1.09	1.99	0.13		
JRRM 605	75.5	1.31	10.8	4.84	1.94	1.55	0.17	0.54	1.99	0.45	0.35	0.12		
JRRM 606	72.5	1.26	22.1	0.53	0.02	0.00	0.93	0.01	0.32	2.03	0.01	0.11		
JRRM 607	61.6	1.21	32.9	3.53	0.04	0.00	0.12	0.04	0.03	0.02	0.08	0.13		
JRRM 608	58.8	1.21	34.6	0.70	0.52	0.49	0.09	0.01	3.12	0.03	0.11	0.10		
JRRM 609	55.6	1.12	40.5	0.88	0.30	0.01	0.15	0.02	0.15	0.94	0.08	0.15		
JRRM 610	48.7	0.98	45.7	0.45	3.07	0.00	0.30	0.01	0.54	0.04	0.11	0.09		

RM RICE STRAW ASH - THERMOSTIL

typical analysis														100 g units	
Number	SiO ₂	Al ₂ O ₃	C	CO ₂	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	TiO ₂	-H ₂ O 900°C	
DH 5704	92.49	0.198	3.60	0.008	0.30	0.090	0.97	0.362	0.062	0.070	0.273	0.177	0.004	1.38	
DH 5706	87.92	0.073	3.62	0.056	1.04	0.125	3.10	0.526	0.271	0.124	0.755	0.593	0.231	1.38	
DH 5708	86.67	1.15	3.83	0.094	0.97	0.931	0.872	3.10	0.117	0.085	0.226	0.255	0.126	1.70	
DH 5707	82.15	0.223	4.03	0.158	1.78	1.50	1.89	5.09	0.259	0.117	0.443	0.524	0.223	1.82	
DH 5705	76.31	0.363	4.33	0.265	2.51	2.89	0.653	9.60	0.245	0.116	0.123	0.409	0.217	2.32	

RM SAND FOR SLIDING GATES

typical analysis listed in mass %

100 g units

Number	SiO ₂	Al ₂ O ₃	C	CaO	Cr ₂ O ₃	Fe	K ₂ O	MgO	Mn ₃ O ₄	Na ₂ O	NiO	P ₂ O ₅	S	TiO ₂	V ₂ O ₅	WO ₃	ZrO ₂	-H ₂ O	900°C
DH 4501	72.21	4.92	0.607	0.025	11.53	5.14	0.633	2.40	0.065	0.059	0.053	0.008	.	0.195	0.102	.	.	.	0.204
DH 4502	65.97	5.69	0.47	0.038	14.75	6.31	0.693	3.24	0.074	0.062	0.033	0.007	0.010	0.203	0.110	.	.	.	0.177
DH 4505	58.23	6.62	0.659	0.031	18.41	11.30	0.502	3.98	0.096	0.059	0.045	<0.01	0.022	0.242	0.139	0.114	0.003	.	.
DH 4507	27.95	11.00	0.326	0.096	33.41	14.51	.	7.29	0.179	.	0.090	CO ₂	0.013	0.486	0.270	0.019	.	.	0.129
DH 4506	10.22	12.93	0.700	<0.017	42.01	25.03	.	8.18	0.703	.	.	.	0.007	0.510	0.382	.	.	.	0.091

RM FOUNDRY SAND

typical analysis listed in mass % except * which is mg/kg

100 g units

Number	BaO	CeO ₂	Co ₃ O ₄	Cr ₂ O ₃	CuO	La*	Li*	Nd*	NiO	Sr*	TiO ₂	V ₂ O ₅	ZnO	ZrO ₂
DH 3301	0.015	0.003	0.020	0.538	0.012	14.0	6.7	8.3	0.003	35.0	0.213	0.007	0.015	0.127

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	Mn ₃ O ₄	Na ₂ O	P ₂ O ₅	SO ₃	SiO ₂
DH 3301	2.76	0.720	3.84	0.169	0.570	0.070	0.297	0.027	0.116	90.36

CRM ZIRCON SAND

Number	ZrO ₂ + HfO ₂	Al ₂ O ₃	Fe ₂ O ₃	SiO ₂	TiO ₂	LOI	Units
JCRM R501	66.5	0.39	0.06	32.6	0.16	0.11	100 g
JCRM R502	60.3	5.87	0.10	32.8	0.24	0.26	100 g

CRM SILICA POWDER SET

SOLD IN SET/3 ONLY

100 g units

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	Na ₂ O	SiO ₂	TiO ₂	LOI
JCRM R405	1.07	0.029	0.053	0.71	0.023	0.060	97.78	0.022	0.13
JCRM R406	1.31	0.016	0.102	0.13	0.005	0.030	96.71	0.564	0.97
JCRM R404	0.0011	0.00002	0.00006	0.00004	<0.00001	0.0001	>99.99	0.0006	0.00

SILICA BRICK

= class, where 1 = CRM and 2 = RM analysis listed in mass %

NH, VS: 75g

SRM: 45g

others: 100g

#	Number	SiO ₂	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	Li ₂ O	MgO	MnO	Na ₂ O	P	P ₂ O ₅	TiO ₂	LOI
1	NH 8-2-03	98.05	0.18	.	.	.	0.25	.	.	.	.	.	.	.	0.85	.
1	VS K1/2	96.0	0.6	.	1.37	.	1.2	.	.	0.05	0.03	.	0.010	.	.	.
1	NH 8-2-02	95.29	0.21	.	1.93	.	0.48	.	.	.	.	.	.	.	0.68	.
1	ECRM 777-1	95.06	0.795	.	2.826	.	0.330	0.154	.	0.071	.	0.02	.	.	0.444	.
1	NH 8-2-01	93.69	0.40	.	2.73	.	0.82	.	.	.	.	.	.	.	0.80	.
1	NH 8-2-06	92.59	0.82	.	2.53	.	1.11	.	.	.	.	.	.	.	0.70	.
1	NH 8-2-04	92.55	0.87	.	3.11	.	0.90	.	.	.	.	.	.	.	0.79	.
1	NH 8-2-05	91.90	1.24	.	3.81	.	0.76	.	.	.	.	.	.	.	0.62	.
1	ECRM 776-1	62.76	29.28	0.122	0.31	0.022	1.43	2.92	0.019	0.476	.	0.488	.	0.062	1.62	.
1	VS K2/4	58.6	35.1	.	0.4	.	2.94	0.69	.	0.48	0.06	0.19	.	.	1.91	.
1	VS K3/2	32.3	63.6	.	0.44	.	1.15	0.15	.	0.27	.	0.17	.	.	1.34	.
1	SRM 198	.	0.16	.	2.71	.	0.66	0.017	0.001	0.07	.	0.012	.	0.022	0.02	0.21
1	SRM 199	.	0.48	.	2.41	.	0.74	0.094	0.002	0.13	.	0.015	.	0.015	0.06	0.17

SILICEOUS MATERIAL

= class, where 1 = CRM, 2 = RM, and 3 = SUS

analysis listed in mass %

T = Total

AMIS also contains 60+ other elements

#	Number	SiO ₂	Al ₂ O ₃	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	TiO ₂	LOI	Units	Other
1	BCS 313/2	99.73	0.068	0.0160	BaO:0.00067	0.0229	0.0108	0.0038	0.00032	0.0057	.	0.0243	.	100 g	SrO: 0.00024
3	AMIS 0415	99.25	0.4	<1	0.001	0.03	0.14	0.03	<1	0.012	0.005	0.02	.	100 g	.
1	GBW 03112	98.51	0.84	0.077	0.00034	0.093	0.061	0.066	(0.0016)	0.021	(0.0041)	0.020	0.24	60 g	.
1	GBW 03113	95.74	2.36	0.17	0.00054	0.21	0.67	0.098	(0.0033)	0.25	(0.0076)	0.036	0.35	60 g	.
1	SRM 2696	95.61	0.2080	0.426	(0.055)	0.652	0.235	0.032	(0.129)	(0.0863)	.	(2.11)	.	70 g	ZnO:0.051
1	GBW 03114	89.59	5.48	0.34	0.0012	0.48	2.07	0.16	(0.010)	1.09	(0.014)	0.102	0.53	60 g	.
2	CERAM CEB1	74.0	16.2	0.52	BaO:0.05	0.48	1.75	0.16	.	0.71	0.14	0.34	5.60	25 or 100g	SrO: 0.02
1	GBW 03117	71.25	2.56	6.37	.	0.18	1.10	3.98	.	13.77	.	0.057	0.44	50 g	.
1	SARM 69 *	66.6	14.4	2.37	Cr:0.0223	7.18T	1.96	1.85	0.129	(0.79)	(0.28)	0.777	(3.6)	100 g	.

* SARM 69 also contains (in ppm) Ba: 518, Co: 28, Cu: 46, Ni: 53, Sc: 20, and Zn: 68.

CRM SYNTHETIC SILICATE WITH TRACE ELEMENTSMaterial base: SiO₂ 72%, Al₂O₃ 15%, Fe₂O₃ 4%, CaMg(CO₃)₂ pure dolomite 4%, Na₂SO₄ 2.5%, K₂SO₄ 2.5% analysis listed in mg/kg ^{70 g units}

Number	Ag	As	B	Ba	Be	Bi	Cd	Ce	Co	Cr	Cu	La	Li	Mn
GBW 07701	(0.034)	2.0	2.1	24	0.26	0.31	0.022	2.0	2.6	2.3	2.0	2.1	15	27
GBW 07702	0.064	5.0	5.1	54	0.56	0.61	0.052	5.0	5.6	5.3	5.0	5.1	18	57
GBW 07703	0.11	10	10.0	104	1.1	1.1	0.1	10.0	10.6	10.3	10.0	10	23	107
GBW 07704	0.21	20	20	204	2.1	2.1	0.2	20	20.6	20.3	20.0	20	33	207
GBW 07705	0.51	50	50	504	5.1	5.1	0.5	50	50.6	50	50	50	63	507
GBW 07706	1.0	100	100	1000	10	10	1.0	100	101	100	100	100	113	1000
GBW 07707	2.0	200	200	2000	20	20	2.0	200	200	200	200	200	213	2000
GBW 07708	5.0	500	500	5000	50	50	5.0	500	500	500	500	500	513	5000
GBW 07709	10.0	.	1000	10000	100	100	10	1000	.	1000	1000	.	1010	10000
GBW 07710	20	.	.	.	200	200	20	.	.	.	2000	.	.	.
GBW 07711	50	.	.	.	500	.	50	.	.	.	5000	.	.	.

continued

Number	Mo	Nb	Ni	Pb	Sb	Sn	Sr	Ti	V	W	Y	Yb	Zn	Zr
GBW 07701	0.21	2.3	2.6	2.5	0.28	0.28	5.0	24	2.8	0.20	2.0	0.2	3.0	2.2
GBW 07702	0.51	5.3	5.6	5.5	0.58	0.58	8.0	54	5.8	0.50	5.0	0.5	6.0	5.2
GBW 07703	1.0	10.3	10.6	10.5	1.1	1.1	13	104	10.8	1.0	10	1.0	11.0	10.2
GBW 07704	2.0	20.3	20.6	20.5	2.1	2.1	23	204	20.8	2.0	20	2.0	21	20
GBW 07705	5.0	50	50.6	50	5.1	5.1	53	504	51	5.0	50	5.0	51	50
GBW 07706	10	100	101	100	10	10	103	1000	101	10	100	10	101	100
GBW 07707	20	200	200	200	20	20	203	2000	200	20	200	20	200	200
GBW 07708	50	500	500	500	50	50	500	5000	500	50	500	50	500	500
GBW 07709	100	.	.	1000	100	100	1000	10000	1000	100	.	100	1000	1000
GBW 07710	200	.	.	2000	200	200	2000	20000	.	200	.	.	2000	.
GBW 07711	500	.	.	5000	500	500	5000	.	.	500	.	.	5000	.

CRM SILICON METAL POWDER

analysis listed in mass %

Number	Al	C	Ca	Cr	Cu	Fe	Mg	Mn	Ni	P	S	Ti	V	Zr
NCS DC25007	0.24	.	0.31	.	.	0.39	.	.	.	.	.	.	.	.
SRM 57B	0.1690	(0.0200)	(0.00222)	(0.00173)	(0.00172)	0.3400	.	0.00782	0.00153	0.00163	(0.0030)	0.0346	(0.0025)	0.00178
IPT 134	0.085	0.025	0.102	0.0011	0.0014	0.29	0.0048	0.0113	0.0006	0.0033	0.002	0.0097	0.0004	.
IPT 135	0.045	0.018	0.011	0.0006	0.0008	0.125	0.0012	0.0070	0.0005	0.0027	0.002	0.0113	0.0003	.
NCS HC25649	0.032	.	0.060	.	.	0.53	.	.	.	0.0067	.	0.026	.	.
NCS HC25648	0.026	.	0.055	.	.	0.44	.	.	.	0.0065	.	0.023	.	.

CRM SILICON CARBIDE

analysis listed in mass %

Number	SiC	C.Free	Al	Al ₂ O ₃	Fe	Fe ₂ O ₃	Units
VS K9/2	99.6	.	(0.002)	(0.06)	.	150 g	
NCS DC93021	98.73	0.11	.	0.11	0.45	100 g	last of stock
NCS DC93022	88.76	2.14	.	1.65	2.14	100 g	last of stock

CRM SILICON CARBIDE

in the chart below, (F) = Free and (T) = Total

analysis listed in mass % except * which is mg/kg

Number	C (T)	C (F)	Si (T)	Si (F)	SiO ₂ (F)	Al	B	Ca	Cr	Cu	Fe	K	Mg
ECRM 781-1	48.251	(37.22)	35.56	(4.66)	.	4.39 (T)	(0.0149)	(0.0433)	(0.0240)	.	(0.8061)	(0.3765)	(0.0421)
NMIJ 8002a	29.93	.	68.01	.	.	0.0189	.	.	0.00619	0.0115	0.0130	.	.
BAM S008	29.9	0.045	.	(<0.03)	(<0.01)	0.0047	0.00030	0.00025	0.000016	0.000010	0.00048	.	0.000007
BAM S003	29.89	0.0493	.	(0.0481)	(0.0600)	0.0372	0.0063	0.00294	0.00035	0.00015	0.0149	.	0.00063
NMIJ 8001a	29.80	.	68.31	.	.	0.00832	.	.	.	.	0.00467	.	.
ECRM 780-1	26.381	.	63.5	.	.	1.86 (T)	.	0.84	.	.	1.30 (T)	(0.0112)	0.051
BCS 360	23.53	(0.085)	60.8	(0.54)	.	6.52	0.115	.	.	.	(0.19)	.	.
BCS 359	23.46	(0.061)	67.6	(0.32)	.	0.118	.	0.108	.	.	0.175	.	.

Number	Mn	Mo	N	Na	Ni	O	Ti	V	Y*	Zr	Notes	Units
ECRM 781-1	(0.0274)	.	(0.0282)	(0.0308)	(0.0210)	.	(0.0320)	(0.0216)	.	.	P: (0.0117) Mo: (0.0264)	100 g
NMIJ 8002a	0.000160	0.0109	.	.	.	.	0.00477	.	0.58	.	Beta Phase	50 g
BAM S008	0.000005	0.0018	.	0.000017	0.00009	0.0146	0.0067	0.0275	.	0.00044	(SiC-6H:99.7, SiC-15R:0.23, SiC-4H:0.06)	50 g
BAM S003	0.000144	.	(0.0093)	0.00177	0.00329	0.0910	0.0079	0.00414	.	0.00252	green micro F800	50 g
NMIJ 8001a	.	.	.	.	.	.	0.000637	.	0.31	.	Alpha Phase	50 g
ECRM 780-1	0.029	.	0.325	(0.0502)	.	.	.	.	.	.	n/a	100 g
BCS 360	.	.	(4.77)	.	.	(4.03)	0.025	.	.	.	Sialon Bonded	100 g
BCS 359	.	.	(7.84)	.	.	(0.53)	0.022	.	.	.	Nitrogen Bearing	100 g

CRM SILICON CARBIDE SET SOLD IN SET/3 ONLY F = Free T = Total 50 g each

Number	T.Si	F.Si	F.SiO ₂	T.C	F.C	Al	Ca	Cl	Cr	Cu	F	Fe	Mg
JCRM R024	68.97	(0.042)	(0.593)	29.85	(0.423)	0.0193	0.0019	(<0.002)	0.0056	(<0.0006)	(<0.001)	0.0219	0.0002
JCRM R025	68.43	(0.014)	(0.356)	30.49	(1.24)	0.0184	0.0008	(<0.002)	0.0097	0.0021	(0.0574)	0.0233	(<0.0001)
JCRM R026	69.03	(0.012)	(0.311)	29.85	(0.598)	0.0059	0.0004	(<0.002)	(<0.0005)	(<0.0006)	0.0686	0.0011	(<0.0001)

Number	Mn	Mo	N	Ni	O	P	S	Ti	V	Zn	Zr
JCRM R024	0.0004	(<0.001)	(0.048)	0.0060	0.97	(<0.01)	(<0.005)	0.0340	0.0013	(<0.0005)	0.0047
JCRM R025	(<0.0003)	0.0126	0.113	0.0011	0.94	(<0.01)	(0.0431)	0.0040	0.0053	(<0.0005)	0.0012
JCRM R026	(<0.0003)	(<0.001)	0.034	(<0.001)	0.71	(<0.01)	(<0.005)	0.0016	0.0018	(<0.0005)	(<0.0005)

CRM SILICON NITRIDE analysis in mass % analysis in mg/kg

Number	Si	N	Al	C	Ca	Fe	O	Co	Mg	Cr	Mn	Na	Ni	Ti	W	Zr	α-phase of Si ₃ N ₄	Units
INDIVIDUAL																		
SRM 8983		39.23		0.107			1.20	.		.	.	.	.	.	.	.	.	4.5 g
NMIJ 8004a	59.226	38.485	0.07397	0.107	0.00727	0.01969	.	10.29	2.987	2.485	8.519	2.146	.	.	.	.	25 g	
BAM ED101	.	38.1	0.0469	0.162	0.00141	0.00795	(1.91)	43.5	4.3	.	.	7.59	.	.	41.3	.	7.43	50 g
SET ONLY																		
JCRM R006	59.57	38.98	<0.002	0.101	<0.0003	0.0012	1.18	.	<2	<6	<1	.	<8	<4	.	<7	.	20 g
JCRM R007	59.45	39.13	0.0707	0.136	0.0931	0.0169	0.79	.	68	49	28	.	<8	58	.	<7	.	20 g
JCRM R008	59.03	38.46	0.116	0.097	0.225	0.171	1.56	.	12	92	86	.	<8	72	.	9	.	20 g

CRM SILICON NITRIDE

analysis listed in mass %

SRM 656 is two 10 g powder units, one α and one β phase powder

Number	Powder	Mass α	Uncertainty ±	Mass β	Uncertainty ±	Amorphous	Uncertainty ±
SRM 656	α	87.5	0.59	3.0	0.05	9.5	0.61
SRM 656	β	16.3	0.81	75.1	2.54	8.6	0.60

CRM BORON NITRIDE

analysis listed in mass %

T = Total

AO = adherent oxide

50 g units

Number	B.T	B.AO	N	Al	C	Ca	Co	Cr	Fe	H ₂ O	Mg	Na	O	Si	Ti
BAM ED103	43.5	0.070	55.6	0.00070	(0.018)	0.0273	(<0.00001)	0.00047	0.00150	(<0.1)	0.0056	0.00123	0.68	0.0017	0.00049

CRM SILICOALUMINUM analysis listed in mass %

Number	Al	Si	Fe	Ba	C	Ca	Co	Cr	Cu	Mg	Mn	Ni	P	S	Sr	Ti	Units
NCS HC14605	36.67	25.94	24.97	9.12	0.13	1.33	.	0.152	0.045	.	0.12	0.167	0.018	0.012	.	.	70 g
NCS HC93615	34.80	29.87	30.47	.	.	.	.	.	.	.	.	.	.	.	.	.	50 g
NCS HC14603	32.84	24.12	33.54	7.57	0.13	0.71	.	0.085	0.061	.	0.14	0.042	0.015	0.015	.	.	100 g
NCS HC14602	32.82	19.21	38.09	6.52	0.14	0.85	.	0.017	0.137	.	0.25	0.014	0.015	0.013	.	.	100 g
NCS HC13602	32.55	32.01	20.59	7.41	0.27	1.17	.	.	.	0.85	0.197	.	0.017	0.0096	.	.	50 g
NCS HC93614	31.91	33.75	27.84	.	.	.	.	.	.	.	0.426	.	0.023	0.022	.	.	50 g
NCS HC93633	29.67	28.31	37.44	0.45	.	.	.	.	.	.	0.25	0.018	0.011	0.011	.	.	50 g
NCS HC14604	25.44	19.21	49.14	2.64	0.24	0.44	.	0.053	0.172	.	0.25	0.018	0.011	0.011	.	.	100 g
NCS HC28635	16.63	43.60	17.53	1.64	1.00	15.18	.	0.054	0.046	0.027	0.095	0.026	0.051	0.040	0.023	.	50 g
NCS HC14609	14.46	33.41	35.46	7.72	0.22	5.74	.	0.116	0.32	0.18	0.33	0.016	0.018	0.017	0.092	0.055	80 g
NCS HC14610	13.47	40.58	23.25	10.70	0.24	8.25	0.0032	0.032	0.29	0.12	0.23	0.012	0.021	0.025	0.094	0.124	80 g
NCS HC14608	9.14	53.39	14.22	12.39	0.13	8.28	0.0022	0.021	0.176	0.21	0.17	0.0061	0.022	0.021	0.132	0.084	80 g
NCS HC28637	5.42	52.76	10.54	15.33	0.63	11.10	.	0.031	0.017	0.019	0.15	0.0070	0.024	0.073	0.042	.	50 g
NCS HC28636	4.07	50.36	16.68	24.26	0.34	1.44	.	0.083	0.032	0.032	0.11	0.021	0.016	0.038	0.095	.	50 g
NCS HC14611	1.47	56.74	5.77	17.00	1.56	13.61	0.0016	0.0044	0.0097	0.045	0.065	0.0020	0.016	0.14	0.22	0.126	80 g

CRM SILICOBARIUM analysis listed in mass % 50 g units

Number	Ba	Si	Al	C	Ca	Fe	Mg	Mn	P	S	Sr
NCS HC93632	27.54	47.56	2.78	0.99	.	11.75	.	0.16	0.024	0.13	.
NCS HC93634	14.14	52.62	1.82	0.64	14.08	12.97	0.051	0.104	0.022	0.204	0.063
NCS HC93631	10.00	37.19	13.46	0.78	5.16	27.56	0.098	0.43	0.032	0.044	.

SILICOCALCIUM

= class, where 1 = CRM and 2 = RM

#	Number	Ca	Si	Al	Ba	C	Cr	Cu	Fe	Mg	Mn	Mo	Ni	P	S	Ti	Units
2	BS 119	32.3	62.3	0.46	.	0.30	.	.	3.0	.	.	.	.	0.033	0.01	.	100 g
1	NCS HC93613	31.67	56.20	1.77	.	1.30	.	.	5.58	.	.	.	.	0.018	0.088	.	50 g
1	NCS HC37620	30.70	60.09	Sol. Al:1.09	.	0.68	.	.	.	.	.	.	.	0.017	0.033	.	50 g
2	DH 0406	30.48	60.79	0.333	.	0.61	<0.009	.	5.17	0.010	0.056	.	.	0.031	0.022	0.019	50 g
1	NCS HC11604a	30.45	56.02	1.97	.	0.94	.	.	6.93	.	0.037	.	.	0.054	0.073	.	50 g
1	VS F26/2	29.9	59.5	1.52	.	.	.	.	6.29	.	.	.	.	0.024	0.030	0.156	100 g
2	DH 0402	28.48	58.68	1.13	.	.	0.010	0.014	6.74	0.049	0.051	.	.	0.014	0.055	0.055	50 g
1	NCS HC93612	28.25	55.31	1.88	.	2.44	.	.	6.08	.	.	.	.	0.019	0.132	.	50 or 100 g
1	NCS HC93627	28.02	57.43	1.76	.	1.02	.	.	6.94	.	.	.	.	0.030	0.045	.	50 g
2	DH 0404	26.79	62.53	1.74	.	0.533	0.016	0.020	5.03	0.036	0.094	.	0.007	0.011	.	0.238	50 g
1	NCS HC37621	25.25	60.19	Sol. Al:1.55	.	0.71	.	.	.	.	.	.	.	0.031	0.020	.	50 g
1	VS F25/3	21.3	51.5	0.67	.	.	.	.	23.06	.	.	.	.	0.011	0.0056	.	100 g
1	NCS HC11605	13.22	53.46	2.34	14.02	0.385	0.054	0.079	13.57	0.022	0.075	Sr:0.235	0.023	0.014	0.039	.	60 g
1	VS F44	12.6	49.7	1.68	.	0.166	.	.	19.91	9.6	.	.	V:(2.5)	0.014	0.0066	.	100 g

CRM

SILICOCHROMIUM

Number	Cr	Si	Fe	Al	B	C	Co	Cu	Mn	Ni	P	S	Ti	V	Units
SRM 689	36.4	39.5	23.2	0.049	0.0017	0.043	0.034	0.013	0.32	0.20	0.026	0.002	0.40	0.09	100 g
NCS HC25633	33.90	44.06	.	1.00	.	0.045	.	.	0.29	.	0.013	(0.002)	.	.	50 g
NCS HC25643	32.62	49.17	.	1.24	.	0.018	.	.	0.429	.	0.0083	0.0025	.	.	50 g

SILICOMANGANESE

= class, where 1 = CRM and 2 = RM

#	Number	Mn	Si	Fe	C	Co	Cr	Cu	Ni	P	S	Ti	V
2	DH 0107	77.82	17.36	2.64	1.65	0.030	.	0.012	0.020	0.135	.	0.122	0.015
1	MHCX04	70.0	22.7	5.31	0.80	0.111	0.103	0.104	0.122	0.149	0.012	0.28	0.085
1	NCS HC25605b	69.77	14.20	.	2.21	.	.	.	.	0.153	0.0052	.	.
1	NCS HC25657	67.96	25.03	.	0.58	.	.	.	.	0.065	0.011	0.18	.
1	VS F23/1	67.53	21.18	.	1.45	.	.	.	.	0.235	0.0155	.	.
1	NCS HC26611b	67.44	18.24	.	1.24	.	.	.	.	0.080	0.009	.	.
1	NCS HC28618	67.40	19.34	11.65	1.05	0.017	0.045	0.051	0.036	0.107	0.017	0.255	0.063
1	NCS HC37612	67.02	18.96	.	1.10	.	.	.	.	0.178	0.016	0.276	.
1	NCS HC18603	66.70	17.21	.	1.70	.	.	.	.	0.183	0.025	.	.
1	NCS HC93619	66.40	17.55	.	1.65	.	.	.	.	0.137	0.025	.	.
1	NCS HC11603b	66.37	17.63	.	1.34	.	.	.	.	0.065	0.008	.	.
1	NCS HC25605a	66.30	18.28	.	1.09	.	.	.	.	0.145	0.010	0.18	.
1	NCS HC19607	66.20	18.41	.	1.56	.	.	.	.	0.126	0.022	.	.
1	NCS HC25640	65.85	24.74	.	0.181	.	.	.	.	0.104	0.010	.	.
1	NCS HC93625	65.74	17.19	.	1.66	.	.	.	.	0.151	0.026	.	.
1	NCS HC11603a	65.67	17.49	.	1.33	.	.	.	.	0.065	0.011	.	.
1	NCS HC37605	65.64	17.67	.	1.55	.	.	.	.	0.14	0.024	0.46	.
1	MHCX03	65.5	29.2	4.92	0.04	.	0.20	0.13	0.11	0.047	0.004	0.49	.
1	NCS HC25654	65.29	19.26	.	0.876	.	.	.	.	0.109	0.0122	0.19	.
2	DH 0106	65.24	18.38	14.60	1.21	0.013	0.011	0.017	0.042	0.080	0.010	0.121	0.015
1	NCS HC28617	64.97	17.59	15.16	1.57	0.035	0.055	0.096	0.092	0.127	0.018	0.221	0.060
1	NCS HC93624	64.86	16.87	.	1.79	.	.	.	.	0.120	0.024	.	.
1	NCS HC93618	63.91	19.04	.	1.13	.	.	.	.	0.140	0.022	.	.
1	NCS HC93626	63.80	16.42	.	1.91	.	.	.	.	0.097	0.020	.	.
1	JSS 705-5	62.69	14.99	.	1.941	.	.	.	.	0.239	(0.0087)	.	.
1	NCS HC28616	62.53	14.33	20.00	2.28	0.048	0.060	0.080	0.167	0.205	0.020	0.222	0.095
2	DH 0302	62.17	27.95	8.69	0.092	0.054	0.016	0.031	0.032	0.089	.	0.288	0.015
1	NCS HC26621	61.49	27.49	.	0.039	.	.	.	.	0.072	0.009	0.24	.
2	DH 0303	60.60	30.66	7.52	0.029	0.023	0.024	0.016	0.039	0.059	.	0.444	0.015
1	NCS HC25641	60.29	27.88	.	0.082	.	.	.	.	0.078	0.0069	0.41	.
1	NCS HC37606b	60.13	13.87	.	2.26	.	.	.	.	0.42	0.040	0.25	.
1	NCS HC25646	59.34	32.90	.	0.018	.	.	.	.	0.043	0.0034	0.24	.
2	DH 0301	59.06	30.16	9.91	0.015	0.028	0.035	0.019	0.033	0.050	.	0.471	0.015
1	NCS HC26620	54.97	19.15	.	0.40	.	.	.	.	0.060	0.011	0.24	.

Number	As	B	Ca	Pb	Sb	Zr	Units
DH 0107	.	.	.	.	.	.	50 g
MHCX04	0.004	0.03	(0.010)	0.008	.	Zn:0.012	70 g
NCS HC25605b	.	.	.	.	.	.	50 g
NCS HC25657	.	.	.	.	.	.	50 g
VS F23/1	.	.	.	.	.	.	100 g
NCS HC26611b	.	.	.	.	.	.	50 g
NCS HC28618	0.0099	.	.	0.0007	0.0004	.	50 g
NCS HC37612	.	.	.	.	.	.	50 g
NCS HC18603	.	.	.	.	.	.	50 g
NCS HC93619	.	.	.	.	.	.	100 g
NCS HC11603b	.	.	.	.	.	.	100 g
NCS HC25605a	.	0.0063	.	.	.	.	50 g
NCS HC19607	.	.	.	.	.	.	50 g
NCS HC25640	.	.	.	.	.	.	50 g
NCS HC93625	.	.	.	.	.	.	50 g
NCS HC11603a	.	.	.	.	.	.	100 g
NCS HC37605	.	.	.	.	.	.	50 g
MHCX03	.	(0.009)	.	.	.	.	100 g
NCS HC25654	.	0.022	.	.	.	.	50 g
DH 0106	.	.	.	.	.	.	50 g
NCS HC28617	0.010	.	.	0.0005	0.0009	.	50 g
NCS HC93624	.	.	.	.	.	.	50 g
NCS HC93618	.	.	.	.	.	.	100 g
NCS HC93626	.	.	.	.	.	.	50 g
JSS 705-5	.	0.0231	.	.	.	.	150 g
NCS HC28616	0.015	.	.	0.0012	0.0025	.	50 g
DH 0302	.	.	.	.	.	0.008	50 g
NCS HC26621	.	.	.	.	.	.	50 g
DH 0303	.	.	.	.	.	.	50 g
NCS HC25641	.	0.021	.	.	.	.	50 g
NCS HC37606b	.	.	.	.	.	.	50 g
NCS HC25646	.	0.048	.	.	.	.	50 g
DH 0301	.	0.0048	.	.	.	.	50 g
NCS HC26620	.	Al:0.015	.	.	Mo:(0.0009)	.	50 g

Al: 0.010, Mo: 0.016, Sn: 0.008

SILICOZIRCONIUM

	Number	Zr	Si	Fe	Al	C	Ca	Cr	Cu	Hf	Mn	N	Ni	P	S	Ti	Units
CRM	VS F27/2	51.5	26.1	(12)	7.48	0.111	.	.	1.47	.	.	.	.	0.044	(0.001)	0.215	100 g
RM	DH 3001	36.06	51.14	8.87	0.852	0.338	0.157	0.004	.	0.804	0.210	0.027	0.013	0.033	0.002	0.073	50 g

CRM BASIC SLAG

analysis listed in mass %

100 g units

Number	Al	B	Ca	Cr	F	Fe	K	Mg	Mn	Na	P	S	Si	Ti	V	Zn
IRSID 802-1	8.53	0.0245	30.62	0.0053	0.243	0.576	0.491	2.87	0.460	0.236	0.109	0.714	15.16	0.366	0.028	0.0025
ECRM 804-1	0.407	.	36.88	.	.	11.92	.	0.88	1.48	.	7.67	0.127	2.59	0.152	0.460	.

IRON MAKING SLAG

= class, where 1 = CRM and 2 = RM

#	Number	CaO	SiO ₂	Al ₂ O ₃	C	Fe	FeO	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	S	TiO ₂	Units
1	NH 7-1-009	49.6	32.8	9.2	.	0.47	.	(0.19)	1.1	0.60	(0.14)	.	1.17	0.38	75 g
2	BS Slag 2	44.6	37.0	10.3	0.20	0.23	.	0.17	5.87	0.19	0.16	.	1.14	0.20	50 g
1	IRSID 803-1	43.28	36.38	13.19	.	0.613	.	.	4.05	0.713	.	0.270	0.767	0.502	100 g
1	IRSID 802-1 *	42.84	32.43	16.12	.	0.576	.	.	4.76	0.593	.	0.250	0.714	0.611	100 g
1	NH 7-1-008	42.1	39.1	8.4	.	0.30	.	(0.52)	6.1	0.73	(0.33)	.	(0.65)	0.30	75 g
1	NH 7-1-005	38.8	35.3	10.0	.	0.21	.	(0.19)	12.0	0.47	(0.13)	.	(0.85)	0.32	75 g
2	BS 100A	37.6	35.2	10.13	0.07	0.30	.	0.49	12.9	0.35	0.18	.	1.2	0.50	100 g
1	CAN SL-1	37.48	35.73	9.63	.	.	0.92	(0.51)	12.27	(0.86)	(0.39)	.	1.26	(0.38)	200 g
2	BS Slag 3	37.3	37.44	12.9	0.03	0.25	.	0.81	8.3	1.72	0.26	.	0.81	0.63	50 g
1	NH 7-1-010	31.2	44.0	7.94	.	5.5	.	(0.59)	0.73	3.40	(0.18)	.	0.14	0.91	75 g
1	NH 7-1-007	31.2	39.0	6.2	.	0.55	.	(0.38)	18.9	0.78	(0.24)	.	(0.57)	0.39	75 g
2	BS Slag 1	30.2	36.7	18.5	0.07	0.28	.	0.36	11.01	1.11	0.20	.	1.8	0.42	50 g
1	NH 7-1-014	30.1	33.6	24.0	.	1.27	.	(0.07)	9.3	(0.3)	(0.07)	.	(0.02)	(0.07)	75 g
1	NH 7-1-011	29.4	21.9	24.0	.	1.9	.	(0.04)	17.5	1.97	(0.19)	.	(0.03)	(0.09)	75 g
1	NH 7-1-013	28.7	20.3	38.6	.	1.12	.	(0.03)	8.0	0.26	(0.04)	.	(0.03)	0.78	75 g
1	NH 7-1-015	28.0	(44.7)	14.5	.	1.7	.	(0.08)	9.2	0.58	(0.1)	.	(0.02)	(0.08)	75 g

* Oxides Calculated, see previous chart "BASIC SLAG" for actual certified values

STEEL MAKING SLAG

= class, where 1 = CRM and 2 = RM

GBW, RH: 50 g units

NH: 75 g units, last of stock

all others: 100 g units

#	Number	CaO	T.Ca	CaF ₂	SiO ₂	Al ₂ O ₃	Cr ₂ O ₃	F	Fe	FeO	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	s.P ₂ O ₅	S	TiO ₂	V ₂ O ₅
2	RH02	64.7	.	.	(12.9)	11.0	(0.03)	.	(0.2)	(0.2)	.	3.5	0.024	.	P:0.003	.	(0.9)	0.07	.
1	JK S11 *	.	60.0	.	26.8	2.85	0.17	(7.9)	(0.2)*	(0.2)*	.	4.7	0.12	.	(<0.005)	.	0.30	0.95	(<0.01)
2	BS 101/3	53.7	.	.	18.8	1.47	.	.	11.0	(0.006)	3.1	5.2	(0.028)	0.77	.	.	0.19	0.92	.
1	CMSI 1745	.	37.64	1.41	14.91	1.78	.	.	13.38	12.33	.	9.28	1.86	.	1.02	.	0.097	0.42	.
1	BS 101/4	52.5	.	.	16.7	0.86	.	.	(13.3)	.	0.007	4.8	4.79	0.018	0.81	.	0.15	1.16	17025
2	BS 101/1	52.4	.	.	23.7	0.61	.	.	6.3	.	(0.003)	9.2	3.45	0.009	0.78	.	0.18	0.8	.
1	IRSID 804-1	51.60	.	.	5.54	(0.79)	.	.	11.92	.	.	1.46	1.91	.	17.58	.	0.127	0.25	0.82
1	BCS 381	49.0	.	.	8.78	0.67	0.33	.	13.3	3.69	.	1.03	3.16	.	15.7	15.2	0.19	0.35	0.94
1	IRSID 805-1	48.92	.	.	6.63	0.616	.	.	14.87	.	1.86	2.05	.	16.20	.	0.092	0.342	0.918	.
2	BS 101/2	47.0	.	.	16.8	0.9	.	.	15.2	.	(0.006)	8.1	4.8	0.031	0.70	.	0.23	0.8	.
1	IRSID 806-1	46.13	.	.	11.72	0.901	.	.	17.89	.	.	3.02	5.94	.	2.25	.	0.110	0.504	0.514
2	BS 101/5	46.0	.	.	14.9	0.57	.	.	19.2	.	(0.005)	5.5	5.7	(0.043)	0.71	.	0.12	1.1	.
1	ECRM 879-1	43.70	.	.	8.82	0.803	0.477	0.368	18.97	.	.	2.19	4.45	.	8.46	7.59	0.102	0.535	0.738
1	NH 143	42.90	.	.	4.88	(0.50)	0.97	.	14.53	8.62	.	5.29	2.84	.	16.71	.	0.083	0.15	.
1	NH 146	40.56	.	.	11.38	4.29	0.69	.	20.30	18.47	.	5.47	5.52	.	2.11	.	0.165	0.39	.
1	NH 148	39.76	.	.	6.52	1.62	0.86	.	18.44	0.29	.	4.94	3.78	.	10.84	.	0.112	0.25	last
1	NH 151	34.83	.	.	15.97	2.06	0.65	.	14.94	0.14	.	5.05	8.44	.	7.92	.	0.079	0.53	.
1	NH 156	34.66	.	.	15.20	7.80	0.75	.	16.35	0.14	.	4.66	3.81	.	5.98	.	0.111	0.36	.
1	NH 155	34.35	.	.	19.19	10.20	0.68	.	13.17	0.11	.	4.70	3.91	.	4.26	.	0.124	0.38	last
1	CMSI 1744	26.73	.	.	8.91	3.92	.	.	34.33	36.55	.	12.15	2.01	.	0.87	.	0.107	0.32	.
1	VS W4/4	25.5	.	.	16.7	3.62	.	.	23.2	25.5	.	18.3	4.17	.	P: 0.259	.	0.037	1.02	.
1	NH 152	21.95	.	.	15.91	2.60	28.67	.	14.40	12.79	.	6.17	4.85	.	(0.12)	.	0.028	0.37	.
1	NH 150	21.77	.	.	15.69	3.23	1.74	.	24.23	27.30	.	(14.46)	8.16	.	0.62	.	0.044	0.15	.
1	NH 145	20.85	.	.	22.43	2.39	0.99	.	27.97	30.46	.	2.71	9.26	.	2.05	.	0.089	0.56	.
1	NH 149	9.85	.	.	8.42	3.36	53.81	.	14.09	8.12	.	2.89	3.74	.	(0.03)	.	0.040	0.22	.
1	SARM 77	3.64	.	.	26.8	27.5	12.5	.	5.31T	.	.	22.99	.	.	.	.	0.32T	.	.
1	NH 154	(1.15)	.	.	48.67	3.68	1.54	.	10.65	13.36	.	2.44	(28.0)	.	(0.03)	.	0.074	0.27	.
#	Number	CaO	T.Ca	CaF ₂	SiO ₂	Al ₂ O ₃	Cr ₂ O ₃	F	Fe	FeO	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	s.P ₂ O ₅	S	TiO ₂	V ₂ O ₅

* JK S11 lists total Fe as FeO

BLAST FURNACE SLAG

analysis in mass %

JSS: 70g

NCS HC15x, 28x: 80g

NCS HC13x, all others: 100g

#	Number	CaO	Ca	SiO ₂	Al ₂ O ₃	MgO	Fe	FeO	K ₂ O	Mn	MnO	Na ₂ O	P	P ₂ O ₅	S	TiO ₂
1	IMZ 278	51.70	.	17.43	1.49	3.24	12.37	10.96	(0.013)	4.47	.	(0.026)	0.451	.	0.139	(0.178)
1	IMZ 275	44.35	.	40.99	4.71	5.18	0.548	.	1.01	0.598	.	(0.823)	(0.0097)	.	0.368	0.160
1	IMZ 272	43.85	.	41.80	4.74	5.26	(0.93)	.	(0.423)	0.608	.	(0.342)	0.010	.	0.534	(0.170)
1	IMZ 271	43.81	.	41.35	4.76	5.03	1.57	.	0.426	0.615	.	0.350	(0.011)	.	0.535	(0.188)
1	IMZ 273	43.45	.	42.50	7.09	1.98	1.08	.	0.674	0.882	.	0.620	(0.0097)	.	0.572	0.258
1	IMZ 274	43.37	.	38.91	5.25	4.67	3.36	.	0.456	0.635	.	0.331	(0.011)	.	0.563	0.205
1	JSS 905-2	42.8	.	34.4	13.7	5.4	0.33	.	K:0.262	.	0.34	Na:0.144	0.006	.	(0.75)	0.528
2	DH 3227	41.07	.	37.50	12.09	6.314	0.196	.	0.527	0.433	.	.	.	.	0.989	0.700
2	DH 3231	40.85	.	37.31	12.5	6.225	0.252	.	0.43	0.362	.	.	.	.	1.069	0.776
2	DH 3229	40.68	.	37.35	12.53	6.15	0.193	.	0.529	0.365	.	.	.	0.008	1.05	0.742
2	DH 3221	40.54	28.97	35.69	10.99	10.00	0.230	.	0.525	0.161	.	0.428	.	.	1.55	0.572
2	DH 3230	40.42	.	37.24	12.64	5.94	0.667	.	0.431	0.402	.	.	.	.	1.044	0.729
2	DH 3225	.	28.59	38.06	12.80	7.63	0.385	.	0.115	0.129	.	0.092	.	.	1.55	0.247
2	DH 3218	.	28.35	36.86	12.38	7.63	0.358	.	0.557	0.292	.	0.364	.	0.006	1.32	0.480
2	DH 3219	.	28.24	39.26	10.00	7.47	0.383	.	0.744	0.981	.	0.303	.	0.026	0.818	0.533
1	NCS HC28802	39.91	.	34.79	13.52	8.68	0.23	.	0.50	.	0.489	0.35	.	0.0082	0.976	0.63
1	NCS HC15803	39.66	.	35.00	13.93	5.61	1.76	2.16	0.42	.	0.175	0.26	.	0.0056	0.98	0.51
1	NCS HC13808	39.33	.	36.10	7.73	13.92	0.71	0.63	.	.	0.100	.	.	0.026	0.606	0.37
1	NCS HC28805	39.20	.	34.91	12.80	9.27	0.76	.	.	.	0.090	.	.	0.012	0.90	0.42
1	VS W1/2	38.8	.	37.9	8.48	9.35	.	0.47	.	.	0.22	.	.	.	0.69	.
1	IMZ 276	38.57	.	10.92	1.02	5.75	25.12	22.11	(0.0062)	4.88	.	(0.017)	0.416	.	0.076	(0.172)
1	NCS HC28801	37.95	.	34.65	13.83	9.66	0.253	.	0.58	.	0.382	0.40	.	0.0072	1.03	0.616
1	DH 3234	37.26	.	41.51	11.32	5.37	0.742	.	0.890	0.971	.	.	.	.	0.90	0.618
1	NCS HC28804	37.13	.	31.18	16.26	7.52	2.01	.	.	.	1.23	.	.	0.043	0.79	0.58
2	DH 3232	36.59	.	39.03	11.81	8.12	0.417	.	1.228	0.671	.	0.437	.	.	1.06	0.589
2	DH 3233	36.30	.	41.53	11.53	5.27	1.72	.	0.462	0.907	.	0.193	.	0.026	0.804	0.621
1	NCS HC28803	36.26	.	31.82	16.85	9.92	0.92	.	.	.	0.78	.	.	0.018	0.75	0.52
1	NM 435.1	35.70	.	32.04	20.69	7.77	0.36	0.43	.	.	.	.	.	.	0.91	0.92
2	DH 3228	35.66	.	38.69	11.93	8.56	0.332	.	1.235	1.342	.	0.388	.	0.014	0.781	0.638
1	IMZ 277	35.65	.	16.32	1.61	6.39	23.63	(21.69)	(0.019)	4.04	.	(0.032)	0.392	.	0.065	(0.177)
2	DH 3235	34.35	24.55	39.33	15.68	6.289	2.87	.	0.090	0.341	.	0.103	.	0.015	1.539	0.229
2	DH 3223	.	27.21	38.07	9.39	9.53	0.662	.	1.62	0.726	.	0.391	.	0.012	1.08	0.393
2	DH 3224	.	27.10	37.88	12.86	7.03	2.53	.	0.170	0.145	.	0.102	.	.	1.55	0.265
2	DH 3207	.	26.62	42.09	7.29	9.35	0.872	.	0.600	0.754	.	0.192	.	.	0.65	0.471
1	NH 7-1-006	32.7	.	38.5	7.05	16.8	0.59	.	(0.61)	.	1.24	(0.35)	.	.	(0.56)	0.34
1	VS SH14	32.5	.	28.2	15.4	11.9	0.89	.	.	.	0.59	.	.	.	0.45	9.63
1	VS W3/2	31.7	.	30.1	14.5	12.1	.	.	.	.	0.58	.	.	.	0.51	9.62
1	NCS HC19805	25.57	.	22.67	13.85	9.05	0.80	.	.	.	0.74	.	.	.	0.234	25.28
1	ECRM 883-1 *	.	21.32	16.67	6.55	8.86	0.9820	.	0.393	0.546	.	0.316	0.0033	.	1.0885	1.3331
1	NH 7-1-012	0.57	.	51.4	45.2	(0.21)	1.02	.	(0.02)	.	0.06	(0.52)	.	.	(0.009)	(0.09)

Number	BaO	C tot.	CO ₂	Cr ₂ O ₃	Sr	SrO	V ₂ O ₅	Zn	Zr	ZrO ₂	-H ₂ O 900°C
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IMZ 278	.	.	.	.	.	.	.	(0.003)	.	.	.
IMZ 275	.	.	.	.	.	.	.	(0.0026)	.	.	.
IMZ 272	.	.	.	.	.	.	.	(0.050)	.	.	.
IMZ 271	.	.	.	.	.	.	.	(0.036)	.	.	.
IMZ 273	.	.	.	.	.	.	.	(0.0026)	.	.	.
IMZ 274	.	.	.	.	.	.	.	0.051	.	.	.
JSS 905-2	.	.	.	.	.	.	.	.	.	.	.
DH 3227	0.094	.	.	.	.	0.054	.	.	0.039	.	.
DH 3231	.	.	.	.	.	0.055	.	.	0.044	.	.
DH 3229	.	.	.	.	.	0.055	.	.	0.045	.	.
DH 3221	.	.	.	.	.	0.066	.	.	.	.	.
DH 3230	0.090	.	.	.	.	0.054	.	.	0.042	.	.
DH 3225	0.086	.	.	.	.	0.053	.	.	0.046	.	.
DH 3218	0.093	.	.	0.008	.	0.086	.	.	0.041	.	.
DH 3219	.	0.028	0.060	.	.	0.045	.	.	.	0.07	.
NCS HC28802	.	.	.	.	.	.	.	.	.	.	.
NCS HC15803	.	.	.	Cu:0.0013	.	.	.	.	.	.	.
NCS HC13808	.	.	.	.	.	.	.	.	.	.	.
NCS HC28805	.	.	.	.	.	.	.	.	.	.	.
VS W1/2	.	.	.	.	.	.	.	.	.	.	.
IMZ 276	.	.	.	.	.	.	.	(0.009)	.	.	.
NCS HC28801	.	.	.	.	.	.	.	.	.	.	.
DH 3234	0.087	.	.	0.018	.	0.048	0.016	.	.	.	.
NCS HC28804	.	.	.	.	.	.	.	.	.	.	.
DH 3232	0.087	.	.	.	.	0.076	.	.	0.022	.	.
DH 3233	0.082	.	.	0.021	.	0.047	0.019	.	0.046	.	.
NCS HC28803	.	.	.	.	.	.	.	.	.	.	.
NM 435.1	.	.	.	.	.	.	.	.	.	.	.
DH 3228	0.097	.	.	.	.	0.062	0.007	.	0.035	.	.
IMZ 277	.	.	.	.	.	.	.	(0.012)	.	.	.
DH 3235	0.107	.	.	0.005	.	0.072	0.004	.	0.064	.	.
DH 3223	.	.	.	.	.	0.120	.	.	.	.	.
DH 3224	0.083	.	.	.	.	0.052	.	.	0.043	.	.
DH 3207	.	.	.	.	0.030	.	.	0.016	.	.	.
NH 7-1-006	.	.	.	.	.	.	.	.	.	.	.
VS SH14	.	.	.	.	.	0.23	.	.	.	.	.
VS W3/2	.	.	.	.	.	0.25	.	.	.	.	.
NCS HC19805	.	.	.	.	.	0.44	.	.	.	.	.
ECRM 883-1 *	0.0436	.	Ni:0.00053	0.0130	0.0380	.	0.122	.	0.0276	*	ECRM 883-1 is certified for elements only, not any oxides
NH 7-1-012	.	.	.	.	.	.	.	.	.	.	.

CRM

COPPER CONVERTER SLAG

Number	Ag	Co	Cu	Fe	Ni	Mo	S	V	Units
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IMN ZM6	0.0031	0.39	2.12	46.72	0.080	0.021	1.04	0.006	250 g	last of stock
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CONVERTER SLAG

= class, where 1 = CRM and 2 = RM

#	Number	CaO	Ca	SiO ₂	Al ₂ O ₃	F	Fe	FeO	K ₂ O	MgO	Mn	MnO	Na ₂ O	Nb ₂ O ₅	P ₂ O ₅	S	TiO ₂	V ₂ O ₅
2	DH 3913	56.31	.	9.87	0.76	.	14.61	.	.	1.07	4.40	.	.	0.077	2.29	0.152	0.423	0.553
2	DH 3919	52.95	.	11.94	0.974	.	16.08	.	.	2.235	3.167	.	.	0.044	1.766	0.213	0.368	0.508
2	DH 3911	50.50	.	8.58	0.933	.	18.51	.	.	1.54	4.42	.	.	0.055	2.65	0.160	0.350	0.590
2	DH 3908	47.13	.	12.70	1.096	.	18.96	.	0.008	2.513	4.31	.	.	0.072	1.488	0.110	0.558	0.273
2	DH 3923	46.50	.	11.52	1.27	0.030	20.33	.	0.013	3.23	2.74	.	0.014	0.046	1.73	0.288	1.21	0.522
1	NCS HC14801a	.	41.27	21.72	1.14	2.21	7.65	.	0.0055	4.37	.	0.71	0.013	.	0.914	0.100	0.612	.
1	NCS HC28810	.	33.35	14.45	1.76	.	16.52	.	.	7.10	.	2.78	.	.	1.60	0.120	1.25	.
1	NCS HC28809	.	32.65	15.40	4.38	.	13.50	.	.	7.75	.	2.30	.	.	1.67	0.195	1.02	.

Number	Cr	Cr ₂ O ₃	CuO	MoO ₃	SrO	ZnO	Units
DH 3913	0.168	.	0.009	0.007	.	.	100 g
DH 3919	0.141	.	.	.	0.028	.	100 g
DH 3911	0.154	.	0.007	.	.	0.003	100 g
DH 3908	0.331	.	.	.	0.028	.	100 g
DH 3923	.	0.216	.	.	.	.	100 g
NCS HC14801a	.	.	.	.	.	.	50 g
NCS HC28810	.	.	.	.	.	.	80 g
NCS HC28809	.	.	.	.	.	.	80 g

last of stock

last of stock

CRM ELECTRIC FURNACE SLAG

100 g units

Number	Ca(tot)	Al ₂ O ₃	F	FeO	T.Fe	MgO	MnO	P ₂ O ₅	S	SiO ₂	TiO ₂
CMSI 1757	28.87	8.72	0.82	1.89	2.26	15.66	2.39	0.030	0.25	24.80	0.25
CMSI 1756	16.22	4.00	0.17	(15.25)	13.11	21.18	13.16	0.125	0.036	21.37	0.18

CRM FLUORINE SLAG

100 g units

Number	F	T.CaF ₂	Ca	CaO	Al ₂ O ₃	C	FeO	MgO	MnO	P	SiO ₂	TiO ₂	V ₂ O ₅
JK S10	34.4	70.7	50.8	20.3	0.54	0.022	0.10	0.30	0.03	0.002	7.8	0.05	(<0.01)
IMZ E2P 1	31.62	.	36.76	.	24.85	.	.	(0.85)	.	.	2.61	.	.
JK S9	17.3	35.5	39.0	29.1	31.5	0.042	0.04	2.2	0.04	0.005	1.4	0.05	0.11
IMZ E2P 3	15.78	.	39.53	.	19.13	.	.	8.44	.	.	1.68	.	.
IMZ E2P 2	(0.89)	.	24.03	.	41.38	.	.	16.89	.	.	5.81	.	.

RM LADLE SLAG

100 g units

Number	Al ₂ O ₃	CaO	Cr ₂ O ₃	F	Fe	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	S	SiO ₂	TiO ₂	V ₂ O ₅	-H ₂ O @ 1000°C
FQZ 0107	35.86	41.99	0.161	0.190	4.04	0.021	4.92	4.47	0.119	0.710	0.059	4.29	0.540	0.380	(0.09)
FQZ 0207	35.98	47.40	0.053	0.50	2.72	0.013	5.35	2.09	0.035	0.178	0.114	3.72	0.287	0.119	(0.11)
FQZ 0398	1.24	48.58	0.243	0.098	16.69	0.021	1.54	3.76	0.066	1.82	0.068	16.19	0.96	0.91	0.064

Number	Tot. C	CO ₂	Nb ₂ O ₅	SrO	ZrO ₂
FQZ 0107	0.01	0.018	0.020	.	.
FQZ 0207	0.01	0.018	0.010	.	.
FQZ 0398	0.027	<0.01	0.005	0.018	<0.001

MANGANESE SLAG

analysis listed in mass %

DH: RM, 100 g units

VS: CRM, 150 g units

Number	Mn	Mn ₃ O ₄	Al ₂ O ₃	C	CaO	CuO	Fe	Fe ₂ O ₃	K ₂ O	MgO	P	P ₂ O ₅	S	SiO ₂	ZnO
VS SH11/1	48.0	.	.	.	.	.	.	.	.	.	0.014	.	.	.	.
DH 7403	4.93	.	19.84	.	15.95	.	0.088	.	1.30	12.34	.	0.002	0.818	43.23	.
DH 7404	2.66	.	24.61	.	26.16	.	0.086	.	0.630	7.04	.	0.003	0.959	37.39	.
DH 7402	.	0.113	5.99	11.92	0.405	7.02	.	3.96	0.164	0.118	.	14.03	0.114	11.01	45.16

Number	Ba	CO ₂	Cr ₂ O ₃	Na ₂ O	SnO ₂	SrO	TiO ₂	Y ₂ O ₃	ZrO ₂	-H ₂ O@900°C
VS SH11/1	.	.	.	.	.	.	.	.	.	.
DH 7403	(0.475)	0.032	0.007	0.433	.	0.083	0.100	(0.009)	0.039	0.062
DH 7404	0.925	.	0.007	(0.229)	.	0.109	0.164	0.014	0.035	.
DH 7402	.	.	0.086	0.133	0.386	.	0.274	.	0.024	0.077

CRM OPEN HEARTH SLAG

Number	Al ₂ O ₃	CaO	FeO	T.Fe	MgO	MnO	P ₂ O ₅	TiO ₂	S	SiO ₂	Units
NCS HC13811	4.47	18.11	35.40	29.44	13.19	2.32	0.91	0.51	0.050	23.35	100 g

CRM PHOSPHATE SLAG

Number	total P ₂ O ₅	citric acid sol. P ₂ O ₅	CaO	SiO ₂	Units
BAM 826-1	14.65	10.73	46.48	8.96	100 g
BAM 827-1	20.70	18.79	47.38	6.21	100 g

CRM SLAG

analysis listed in mass %

Number	Al ₂ O ₃	C	Ca	CaO	F	Fe	FeO	K ₂ O	MgO	Mn	MnO	Na ₂ O	P	P ₂ O ₅	S	SiO ₂	TiO ₂	V ₂ O ₅	Units
NCS HC18809	21.94	.	35.21	.	.	0.30	.	.	6.55	.	0.18	.	.	0.024	0.69	16.50	1.03	.	100 g
NCS HC28808	18.05	.	.	35.71	.	0.48	0.55	0.42	10.92	.	0.542	0.36	.	0.027	0.885	29.62	0.753	.	50 g
NCS HC28806	16.92	.	.	37.53	.	0.211	0.35	0.46	10.80	.	0.414	0.39	.	0.013	1.15	30.36	0.762	.	50 g
NCS HC18807	16.48	.	.	35.77	.	1.10	.	.	8.77	.	0.74	.	.	0.009	0.90	33.04	0.73	.	100 g
NCS HC18806	14.11	.	.	38.84	.	0.60	.	.	8.45	.	0.30	.	.	0.008	1.13	32.75	2.63	.	100 g
NCS HC25801	4.91	.	.	7.79	.	1.77	.	.	3.99	35.31	.	.	0.0056	.	0.66	33.47	.	.	50 g
NCS HC28807	3.67	.	32.32	.	0.76	13.54	10.44	0.033	7.27	.	4.06	0.057	.	1.72	0.134	14.54	1.13	.	50 g
NCS HC18808	1.25	.	24.10	.	.	25.55	.	.	11.66	.	3.34	.	.	2.00	0.13	13.44	2.22	.	100 g
NCS HC15804	.	0.014	.	.	.	0.22	.	.	.	44.42	.	.	0.0032	.	0.32	25.16	.	.	100 g

CRM TIN SLAG

Number	Sn	Al ₂ O ₃	CaO	FeO	SiO ₂	Units
NCS HC35801	11.96	7.36	4.12	46.18	19.61	80 g
NCS HC35802	2.32	9.32	19.76	22.22	37.49	80 g

CRM TITANIUM SLAG

100 g units

Number	TiO ₂	Al ₂ O ₃	CaO	Cr ₂ O ₃	T.Fe	MgO	MnO	S	SiO ₂	V ₂ O ₅
NCS HC19815	94.69	2.62	0.287	.	1.02	2.67	1.21	0.166	1.92	.
DSZU 123.23-95	85.21	3.40	0.76	1.12	3.29	0.60	0.94	0.16	2.50	0.30
DSZU 123.24-01	85.19	3.28	.	0.76	3.69	.	0.85	0.12	2.88	0.31
NCS HC19814	84.94	3.04	1.83	.	1.08	7.27	0.74	0.247	4.13	.
NCS HC19813	77.66	2.64	1.52	.	6.43	5.28	1.08	0.118	5.50	.

RM TITANIUM SLAG SET

available in SET/9 ONLY

20 g units

Number	Al	Ca	Cr	Fe	Mg	MnO	Si	V
OSO 6-88	1.44	0.29	0.64	4.38	0.44	0.70	0.89	0.21
OSO 7-88	1.80	0.26	0.69	3.72	0.30	0.71	1.29	0.22
OSO 8-88	1.91	0.34	0.70	9.10	0.76	0.97	1.96	0.35
OSO 9-88	2.22	0.43	1.19	10.04	1.23	1.27	2.50	0.64
OSO 10-88	2.99	0.67	1.58	8.86	1.59	1.83	1.68	0.53
OSO 11-88	3.18	1.11	1.64	6.68	0.88	2.31	2.03	0.93
OSO 12-88	2.14	1.23	1.95	9.32	2.29	1.14	1.10	1.00
OSO 13-88	3.93	1.23	2.17	2.33	1.07	1.27	2.23	1.21
OSO 14-88	3.95	1.76	3.75	4.50	2.98	1.41	2.82	1.47

TUNDISH SLAG

100 q units

Number	CaO	SiO ₂	MgO	Al ₂ O ₃	CO ₂	Fe ₂ O ₃	K ₂ O	MnO	Mn ₃ O ₄	Na ₂ O	P ₂ O ₅	S	SO ₃	TiO ₂	-H ₂ O 990°C
DH 5903	61.81	21.33	10.07	3.70	0.016	1.36	0.599	0.043	.	0.174	0.151	0.194	.	0.183	0.023
DH 5904	39.47	30.68	14.53	12.37	.	0.591	0.622	.	0.076	.	0.019	.	.	0.038	.
DH 6604	1.609	24.75	64.45	1.884	0.35	4.62	0.089	.	0.098	0.516	0.084	.	0.026	0.141	1.02
DH 6606	1.37	27.46	62.63	1.30	0.16	4.93	0.070	0.093	.	.	0.055	0.022	.	0.103	1.15
DH 6605	.	.	.	.	0.40179	.	.	.	.	0.347	.	.	.	.	1.15451

Number	BaO	C Tot	Cr ₂ O ₃	F	NiO	SrO
DH 5903	.	.	.	0.046	.	.
DH 5904	0.180	.	.	.	.	0.025
DH 6604	.	0.471	0.255	.	0.165	.
DH 6606	.	.	.	.	.	.
DH 6605	.	.	.	.	.	.

NCS: CRM, 80 g units

DH: RM, 100 g units

Number	CaO	Al ₂ O ₃	Cr	Cr ₂ O ₃	Fe	K ₂ O	MgO	Mn	MnO	Nb ₂ O ₅	P ₂ O ₅	S	SiO ₂	SrO	TiO ₂	V ₂ O ₅	ZrO ₂	Other
DH 5119	53.43	17.04	.	0.075	2.54	0.012	10.84	2.48	.	0.270	0.102	0.188	8.30	0.033	1.37	0.053	0.240	
DH 5120	52.90	20.33	.	0.039	1.55	0.011	11.68	1.27	.	0.202	0.039	0.281	8.13	0.032	1.28	0.016	0.230	
DH 5121	51.14	23.56	0.039	.	1.27	0.011	11.98	0.769	.	0.109	0.028	0.369	7.63	0.031	0.869	0.012	0.232	
NCS HC19812	3.19	2.05	.	0.94	32.16	.	1.86	.	9.05	.	0.064	0.066	18.26	.	9.15	15.79	.	Met. Fe: 0.24
NCS HC19810	2.04	1.25	.	0.93	31.26	.	1.9	.	10.67	.	0.046	0.052	18.25	.	10.02	17.2	.	Met. Fe: 0.22

VANADIUM SLAG

Number	Al ₂ O ₃	CaO	Cr ₂ O ₃	Fe	MgO	MnO	P	SiO ₂	TiO ₂	V ₂ O ₅	Units
VS SH9/3	1.76	1.61	3.32	28.9	3.53	9.73	0.015	16.63	7.39	22.2	150 g

SLUDGE

SRM 2781: 40 a

SRM 2782: 70 g

all others: 40 q units

Number	Type	Ag	Al%	As	Ba	Be	Bi	Ca%	Cd	Ce	Cl	Co	Cr	Cu	Fe%	Ga	Hg	In
SRM 2782	industrial	30.6	1.37	166	254	.	.	0.67	4.17	1240	.	66.3	109	2594	26.9	35	1.10	238
BCR 146R	industrial	.	.	.	.	.	.	.	18.8	.	.	7.39	196	838	.	.	8.62	.
BCR 145R	mixed	.	.	.	.	.	.	.	3.50	.	.	5.61	(313)	696	.	.	2.01	.
SRM 2781	domestic	98	1.6	7.82	.	.	.	3.9	12.78	.	.	.	202	627.4	2.8	.	3.64	.
IRNT WT-L	water treatment	11.9	3.03	8.87	781	3.73	3.73	8.80	1.97	.	.	6.77	79.0	136	1.70	.	4.25	.
IRNT WT-H	water treatment	38.4	2.51	146	772	677	.	4.83	54.7	.	6170	315	1340	3140	1.70	.	31.3	.
IRNT WT-M	water treatment	40.4	2.61	9.84	787	72	.	5.15	11.9	.	.	8.20	939	959	1.74	.	14.3	.
BCR 143R	amended soil	.	.	.	.	.	.	.	71.8	.	.	12.3	(577)	130.6	.	.	1.10	.
BCR 597		.	.	.	.	.	.	.	.	.	.	.	203	.	.	.	.	.

continued SRM 2782 also contains (2.1%) Carbon and trace informational values for Au, Eu, Hf, Rb, Sc, Sm, Ta, Tb, Th, U, Y, and Yb.

[illegible]

CRM RED SLURRY

analysis listed in mass %

50 g units, DSZU individually ShK SET ONLY

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	Na ₂ O	SiO ₂	TiO ₂	
DSZU 123.41-03	12.7	5.96	57.6	1.12	6.18	4.25	available individually
ShK411-01	12.7	5.67	58.7	.	4.57	4.85	available in SET/6 ONLY
ShK412-01	13.3	7.0	57.3	.	4.67	4.32	available in SET/6 ONLY
ShK413-01	11.2	11.8	35.6	.	22.3	2.09	available in SET/6 ONLY
ShK414-01	11.4	3.35	67.2	.	3.44	3.27	available in SET/6 ONLY
ShK415-01	17.3	4.04	44.4	.	10.5	7.11	available in SET/6 ONLY
ShK416-01	15.1	5.13	52.1	.	7.35	5.92	available in SET/6 ONLY

RM SODA ASH

analysis listed in mass %

100 g units

Number	Na ₂ CO ₃	NaCl	Fe ₂ O ₃	Na ₂ SO ₄
BCS 526	99.74	0.126	0.0005	0.008

CRM SURFACE AREAdata listed in m²/g

Number	Multipoint	+/-	Single Point	+/-	Units
SRM 2206	10.99	0.68	10.73	0.68	5 g granulated glass
SRM 1900	2.85	0.09	2.79	0.07	4 g silicon nitride powder

CRM TENSILE CREEP

Number	Creep Rate at 400 h	Time to 2% Strain	Time to 4% Strain	Units
BCR 425	72 x 10 ⁻⁶ h ⁻¹ ± 5	278 h ± 16	557 h ± 30	3 rods 14 mm Ø x 150 mm

CRM TENSILE STRENGTH and HARDNESS

data shows estimates of (material, measurement) uncertainty

Number	ksi Tensile Strength	ksi Yield Strength	% Total Elongation	% Reduction	Hardness	Material	Units
BS TRM-2	136.3 (0.3, 2.0)	128.9 (0.6, 3.9)	16.1 (0.4, 2.5)	54.6 (0.3, 1.7)	.	1018 steel	rod 25 mm Ø x 158 mm
BS TRM-3	98.2 (0.6, 5.5)	44.7 (0.3, 3.1)	52.0 (1.2, 10.8)	57.1 (1.9, 17.3)	HRB 86.3 (0.7, 6.3)	304 steel	sheet 30 cm x 30 cm
BS TRM-1	93.3 (0.3, 2.1)	89.3 (0.5, 3.2)	15.6 (0.2, 1.6)	55.0 (0.4, 2.7)	.	1018 steel	rod 25 mm Ø x 158 mm
BS TRM-1A	83.9 (0.3, 1.7)	70.2 (0.2, 1.5)	18.8 (0.3, 1.8)	56.9 (0.5, 3.2)	.	600 nickel	rod 25 mm Ø x 158 mm
BS TRM-4	36.0 (0.1, 0.8)	28.4 (0.1, 0.7)	11.4 (0.1, 1.1)	(37.0) - -	HR15T 71.9 (0.6, 5.4)	5056 aluminum	sheet 30 cm x 30 cm

CRM TENSILE STRENGTH

Number	0.2% Proof Stress (MPa)	0.5% Proof Stress (MPa)	Tensile Strength (MPa)	Elongation Fracture (A in %)	Reduction in Area at Fracture (Z in %)	Units
BCR 661A	300 ± 7	318 ± 7	750 ± 13	40.9 ± 0.9	60 ± 4	3 rods 14 mm Ø x 150 mm
BCR 661B	300 ± 7	318 ± 7	750 ± 13	40.9 ± 0.9	60 ± 4	1 rod 14 mm Ø x 500 mm

CRM BORON CARBIDE

analysis listed in mass %

analysis listed in mg/kg

100 g

Number	Tot.B	Sol.B	B Isotopic Abundance	C	N	O	Al	Ca	Co	Cr	Cu	Fe	Mn	Na	Ni	Si	Ti	Zr
BAM ED102	78.47	0.116	19.907	21.01	0.209	0.10	157	97	0.39	5.6	2.2	686	10.4	63	8.0	268	96	48.9

CRM CHROMIUM CARBIDE

analysis listed in mass %

Number	C	Cr	S	Si	Units
NCS HC37619	12.53	83.83	0.008	0.22	50 g

CRM SILICON CARBIDE

analysis listed in mass %

Number	SiC	Free C	Si	SiO ₂	Al ₂ O ₃	CaO	Fe ₂ O ₃	MgO	Units
NCS DC93028	97.87	0.48	0.18	0.55	0.10	0.055	0.39	0.008	50 g
NCS DC93026	84.09	1.71	1.45	6.15	1.41	0.17	0.86	0.082	50 g
NCS DC93027	90.86	3.48	0.24	2.00	0.77	0.47	1.12	0.039	50 g

CRM TUNGSTEN CARBIDE

analysis listed in mass %

SRM 276b: 75 g units

all others: 100 g units

Number	Grade	C	Free C	Co	Fe	Mo	Nb	Ni	Ta	Ti
ECRM 783-1	W94-C6	6.188	(0.04)	.	0.0022	.	.	.	.	.
SRM 889	W75-Co9-Ta5-Ti4	(6.0)	.	9.50	(<0.05)	(<0.05)	(<0.05)	(<0.05)	4.60	4.03
SRM 887	W83-Co10	(5.5)	.	10.35	(<0.05)	(<0.05)	(<0.05)	(<0.05)	(<0.01)	(<0.05)
SRM 888	W64-Co25-Ta-5	(4.6)	.	24.7	(<0.05)	(<0.05)	(<0.05)	(<0.05)	4.77	(0.04)

CRM URBAN AEROSOLS analysis listed in mass %

Number	Al	Ba	Ca	Cl	Cu	Fe	K	Mg	Mn	Na	P	Pb	S	Si	Sr	Ti	Zn	
NIES 28	5.04	0.0874	6.69	(0.807)	0.0104	2.92	1.37	1.40	0.0686	0.796	(0.145)	0.0403	(3.91)	(14.9)	0.0469	0.292	0.114	
analysis listed in mg/kg																		
Number	As	Be	Cd	Co	Cr	La	Mo	Ni	Rb	Sb	Sc	Se	Sn	Th	U	V	Y	Units
NIES 28	90.2	(5.09)	5.60	(22.0)	(65.6)	(32.7)	(28.4)	63.8	(64.1)	(20.1)	(10.7)	(14.4)	(21.5)	(11.1)	4.33	73.2	(21.9)	1.5 g

CRM URBAN PARTICULATE MATTER analysis listed in mass % Org = organic Elem = Elemental powder 2 g

Number	Al	C	C.Org	C.Elem	Ca	Cl	Cu	Fe	K	Mg	Mn	Na	Pb	S	Si	Ti	Zn				
SRM 1648a	3.43	(12.7)	(10.5)	(2.3)	5.84	0.4543	0.0610	3.92	1.056	0.813	0.0790	0.4240	0.655	5.51	12.8	0.4021	0.4800				
analysis listed in mg/kg																					
Number	Ag	As	B	Br	Cd	Ce	Co	Cr	Cs	Hf	La	Ni	Rb	Sb	Sc	Se	Sm	Sr	Th	V	W
SRM 1648a	6.0	115.5	161	502	73.7	54.6	17.93	402	3.4	(5.2)	39	81.1	51.0	45.4	(6-120)	28.4	4.3	215	(7-107)	127	4.6

CRM VANADIUM NITRIDE analysis listed in mass %

Number	V	N	Al	C	Mn	P	S	Si	Units
NCS HC93630	77.73	14.57	0.164	3.96	0.0082	0.0075	0.0014	0.061	25 g

CRM VEHICLE EXHAUST PARTICULATE

Number	Al	As	Ca	Cd	Co	Cr	Cu	K	Mg	Na	Ni	Pb	Sb	Sr	V	Zn
NIES 08	0.33	0.00026	0.53	0.00011	0.00033	0.00255	0.0067	0.115	0.101	0.192	0.00185	0.0219	0.00060	0.0089	0.0017	0.104
informational analysis listed in mg/kg																
Number	Ag	Br	Ce	Cs	Eu	La	Lu	Mo	P	Rb	Sc	Se	Sm	Th	Units	
NIES 08	(0.20)	(56)	(3.1)	(0.24)	(0.05)	(1.2)	(0.02)	(6.4)	(510)	(4.6)	(0.55)	(1.3)	(0.20)	(0.35)	7 g	

CRM ZIRCON CONCENTRATE DSU: 20 or 50 g units all others: 100 g units

Number	ZrO ₂	ZrO ₂ +HfO ₂	SiO ₂	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	HfO ₂	MgO	Na ₂ O	P ₂ O ₅	SnO ₂	TiO ₂	ThO ₂	U ₃ O ₈	LOI
DSZU 123.47-03	.	66.1	.	0.75	.	0.074	.	.	.	.	0.099	.	0.22	.	.	.
SARM 62 *	64.2	.	32.8	0.88	(0.11)	0.07	.	1.31	(0.04)	.	0.12	.	0.13	0.0158	0.0354	.
BCS 204A	.	53.8	37.6	0.74	0.15	0.18	0.017	.	0.012	0.014	0.77	1.69	2.22	.	.	0.50

* SARM 62 lists Total Fe as Fe₂O₃ and Ti as TiO₂**CRM ZIRCONIA - Yttrium Stabilized Zirconium Oxide**

Number	Al	Ca	Fe	Hf	Mg	P	Si	Th	Ti	U	Y	monoclinic ZrO ₂	Units
ERM-ED105	0.0660	0.0242	0.0095	1.535	0.00129	(<0.0075)	0.0195	0.0112	0.0497	0.0292	6.11	(1.94)	powder 47 g

CRM ZIRCONIA SET available in SET/4 only 50 g units

Number	Al ₂ O ₃	CaO	Fe ₂ O ₃	HfO ₂	K ₂ O	MgO	Na ₂ O	Nb ₂ O ₅	SiO ₂	TiO ₂	LOI
JCRM R051	.	0.0017	0.0017	1.96	.	0.0004	0.015	.	(0.005)	(0.0005)	0.71
JCRM R052	.	0.019	(0.0004)	1.81	0.0013	0.0042	0.021	.	0.019	0.0012	0.25
JCRM R053	.	0.021	0.030	1.67	(0.0007)	0.0020	0.028	0.054	0.036	0.127	0.65
JCRM R054	0.136	0.535	0.132	1.60	(0.0003)	0.208	0.0027	0.427	0.300	0.138	0.15