

22. Cement/Red Mud/Alumina

Powders

22.7.1 Cements

	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	TiO ₂	SrO	Mn ₂ O ₃	P ₂ O ₅	F	ZnO	Cr ₂ O ₃	L.O.I.	Size
CRM 227 B 1880a	63.83	20.31	5.18	2.81	1.72	3.25	0.19	0.92	0.25	0.083	0.127	0.22	...	(0.005)	0.007	(1.32)	4 x 5g
CRM 227 B 1881a	57.58	22.26	7.060	3.09	2.981	3.366	0.199	1.228	0.3663	0.036	0.1042	0.1459	(0.09)	0.0489	0.0588	1.59	4 x 5g
CRM 227 B 1882a	39.29	4.01	39.14	14.67	0.51	...	0.021	0.051	1.786	0.024	0.06	0.07	...	0.004	0.113	(0.20)	4 x 5g
CRM 227 B 1883a	29.52	0.24	70.04	0.078	0.19	...	0.30	0.014	0.02	0.019	(0.003)	(0.003)	...	...	0.006	(0.35)	4 x 5g
CRM 227 B 1884a	62.26	20.57	4.264	2.695	4.475	2.921	0.2161	0.997	0.186	0.2984	0.0853	0.1278	(0.11)	0.0101	0.0166	(1.06)	4 x 5g
CRM 227 B 1885a	62.39	20.909	4.026	1.929	4.033	2.83	1.068	0.206	0.195	0.638	0.0478	0.122	(0.13)	0.0029	0.0195	(1.68)	4 x 5g
CRM 227 B 1886a	67.87	22.38	3.875	0.152	1.932	2.086	0.021	0.093	0.084	0.018	0.0073	0.022	(0.02)	(0.001)	0.0024	(1.56)	4 x 5g
CRM 227 B 1887a	60.90	18.637	6.202	2.861	2.835	4.622	0.4778	1.100	0.2658	0.322	0.1186	0.306	(0.09)	0.0667	0.009	(1.43)	4 x 5g
CRM 227 B 1888a	63.23	21.22	4.265	3.076	2.982	2.131	0.1066	0.526	0.263	0.082	0.1256	0.080	(0.11)	0.107	0.0186	(1.75)	4 x 5g
CRM 227 B 1889a	65.34	20.66	3.89	1.937	0.814	2.69	0.195	0.605	0.227	0.042	0.2588	0.110	(0.05)	0.0048	0.0072	(3.28)	4 x 5g
227 CG 03201a	62.34	20.56	5.02	3.16	1.40	2.29	0.18	1.15	0.21	...	...	...	...	...	...	3.39	25g
CRM 227 A 353	64.8	20.5	3.77	4.82	2.42	2.25	0.10	0.49	0.16	0.23	0.23	0.077	...	...	(0.02)	...	100g
CRM 227 A 354	70.0	21.8	4.85	0.30	0.42	2.25	0.10	0.11	(0.04)	0.11	0.058	0.12	...	...	(0.003)	...	100g
CRM 227 A 372/1	65.3	20.3	5.37	3.42	1.31	2.95	0.10	0.75	0.27	(0.05)	0.074	(0.07)	...	...	(0.01)	...	100g

The Na₂O and K₂O values for 227A 372 are acid soluble concentrations.

Mn₃O₄

ZrO₂

227 DH X0201	60.56	22.56	6.55	2.09	2.19	4.28	0.145	0.907	0.314	0.118	0.125	0.118	0.059	0.032	0.008	...	100g
227 DH X0202	38.1	4.08	39.31	15.83	0.487	0.105	0.033	0.111	1.81	...	0.039	0.043	0.009	0.056	...	...	100g
227 DH X0203	64.97	20.59	5.21	3.5	1.37	2.68	0.28	0.577	0.369	0.124	0.053	0.226	0.035	0.046	0.014	...	100g
227 DH X0204	51.58	28.3	9.79	4.01	1.01	2.94	0.29	0.698	0.575	0.132	0.055	0.315	0.035	(0.03)	0.017	...	100g
227 DH X0205	69.25	22.28	3.94	0.387	0.377	2.82	0.076	0.158	0.338	0.122	0.025	0.139	0.054	0.019	0.007	...	100g
227 DH X0206	55.67	24.28	6.52	3.21	2.88	4.6	0.258	1.54	0.383	0.112	0.064	0.159	0.185	0.011	0.028	...	100g
227 DH X0207	61.38	19.34	4.97	3.8	5.83	2.71	0.138	0.331	0.721	0.088	0.138	0.108	0.364	0.016	0.046	...	100g
227 DH X0208	56.04	20.13	5.38	3.16	10.95	2.56	0.226	0.547	0.358	0.105	0.059	0.164	0.1	0.019	0.023	...	100g

22.7.2 Cement Clinkers (XRD)

	Alite	Belite	Ferrite	Aluminate	Periclase	Arcanite	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	K ₂ O	TiO ₂	P ₂ O ₅	L.O.I.	Size
CRM 227 B 2686	58.6	23.3	14.1	2.3	3.3	...	(63.36)	(22.48)	(4.70)	(3.60)	(4.73)	(0.27)	(0.42)	(0.25)	(0.06)	(0.16)	3 x 10g
CRM 227 B 2687	73.6	9.1	2.2	12.1	...	1.0	(67.20)	(21.43)	(5.53)	(1.98)	(1.48)	(0.83)	(0.72)	(0.27)	(0.29)	(0.17)	3 x 10g
CRM 227 B 2688	66.1	17.9	11.1	5.0	...	1.0	(66.50)	(22.68)	(4.90)	(4.07)	(0.98)	(0.31)	(0.35)	(0.24)	(0.08)	(0.21)	3 x 10g

22.8 Red Mud

	Organic																Size
	Al ₂ O ₃	CaO	Fe ₂ O ₃	Na ₂ O	SiO ₂	TiO ₂	C	L.O.I.	T.E.A.	MgO	MnO	Cr ₂ O ₃	P ₂ O ₅	ZrO ₂	ZnO	SO ₃	
228 CA RM-01	16.8	3.5	53.8	1.4	5.4	5.9	0.36	12.0	4.6	...	...	...	...	...	...	...	100g
228 CA RM-02	13.9	11.2	30.7	3.0	6.2	22.6	0.16	8.4	5.7	...	...	...	...	...	...	...	100g
228 CA RM-03	13.3	8.3	49.2	1.4	4.6	6.5	0.28	12.1	6.4	...	...	...	...	...	...	...	100g
228 CA RM-04	20.6	7.7	29.0	6.8	13.9	6.0	0.43	12.7	6.6	...	...	...	...	...	...	...	100g
228 CA RM-05	21.9	0.9	35.6	8.3	15.7	7.1	0.22	8.9	6.9	...	...	...	...	...	...	...	100g
228 CA CAN	27.9	13.5	4.7	8.5	16.5	8.5	0.23	17.3	13.8	...	...	...	...	...	...	...	100g
228 ML SRC-16	14.5	18.2	30.0	3.99	8.02	3.66	...	16.4	...	...	...	...	...	...	...	...	175g
228 ML SRC-27	17.5	5.63	46.9	4.42	6.89	5.99	...	8.98	...	...	0.78	0.26	1.14	0.15	0.037	0.38	100g
228 ML SRC-79	27.3	11.4	4.86	11.4	23.2	3.07	...	14.1	...	0.12	0.11	0.01	0.28	0.40	0.01	2.79	50g

22.9 Alumina

	CaO	Fe ₂ O ₃	Ga ₂ O ₃	Na ₂ O	SiO ₂	TiO ₂	V ₂ O ₅	ZnO	P ₂ O ₅	SO ₃	Li ₂ O	MnO	Cr ₂ O ₃	B ₂ O ₃	L.O.I. 1000°C	L.O.I. 1200°C	Size
	229 B 699	0.036	0.013	0.010	0.59	0.014	...	0.0005	0.013	0.0002	...	0.002	0.0005	0.0002	...	0.69	0.89	60g
229 CA ALU-01	0.017	0.016	0.011	0.27	0.013	0.004	0.002	0.001	0.0005	0.12	...	...	...	...	1.2	...	100g
229 CA ALU-02	0.009	0.017	0.011	0.25	0.007	0.002	0.002	0.002	0.0005	0.12	...	...	...	...	0.78	...	100g
229 CA ALU-03	0.010	0.011	0.009	0.44	0.010	0.006	0.001	0.001	...	0.05	...	...	...	...	0.77	...	100g
229 CA ALU-04	0.020	0.017	0.009	0.46	0.021	0.009	0.003	0.001	...	0.07	...	...	...	...	0.49	...	100g
229 CA ALU-05	0.033	0.008	0.007	0.37	0.014	0.002	0.001	0.010	...	0.13	...	...	...	...	0.83	...	100g
229 CA ALU-06	0.043	0.008	0.005	0.36	0.017	0.001	0.001	0.009	...	0.11	...	...	...	...	1.31	...	100g
229 CA ALU-07	0.049	0.023	0.006	0.46	0.025	0.004	0.004	0.001	...	0.17	...	...	...	...	0.89	...	100g
229 CA ALU-08	0.008	0.022	0.014	0.42	0.007	0.002	0.003	0.001	...	0.09	...	...	...	...	0.57	...	100g
229 CA ALU-09	0.026	0.008	0.009	0.42	0.018	0.001	0.001	0.001	0.0002	0.08	...	...	...	...	0.60	...	100g
229 CA ALU-10	0.004	0.015	0.013	0.37	0.005	0.002	0.002	...	0.002	0.08	...	...	...	...	0.60	...	100g
229 ML SRP-A-16	0.084	(0.026)	(0.016)	(0.54)	(0.076)	(0.005)	...	(0.002)	...	...	...	...	(0.0003)	0.22	1.36	...	100g
229 ML SRP-A-29	(0.003)	0.0012	0.005	0.19	(0.007)	(0.001)	...	(0.001)	...	...	...	...	(0.0001)	...	34.7	...	250g
229 ML SRP-A-61	0.036	0.009	(0.008)	2.38	0.028	(0.0005)	0.0040	(0.011)	...	...	...	0.0044	...	...	0.70	...	75g
229 ML SRP-A-62	(0.028)	0.009	(0.008)	1.21	0.019	(0.0005)	0.0017	(0.011)	...	...	...	(0.004)	...	...	1.30	...	75g