January 28, 2022

REFERENCE MATERIALS OF THE CERAMIC SOCIETY OF JAPAN

For calibration in chemical investigations of ceramics and glass the Ceramic Society Japan offers following reference materials.
The chemical compositions of those materials were determined by round robin tests.

Chemical Composition of the reference Materials of the Ceramic Society of Japan

Reference Material		Chemical Composition (mass %)														Size
Oxide Powder Material		SiO2	Al2O3	Fe2O3	TiO2	ZrO2 (HfO2)	CaO	MgO	Na2O	K2O	P2O5	MnO	T.S	Cr2O3	Ig. loss	
JCRM R301	Burned Bauxite	7.24	87.5	1.40	2.90	0.13	0.03	0.02	0.03	0.04	0.07				0.35	100g
JCRM R303	Burned Bauxite	5.55	89.49	1.51	2.93	0.110	0.012	0.006			0.064	0.007				100g
JCRM R304	Sillimanite	35.90	55.94	0.585	1.33	0.105	0.427	0.451	0.273	0.329	0.072	0.007			4.26	100g
JCRM R041	Mullite	28.11	70.18	0.598	0.185	0.058	0.059	0.190	0.197	0.174	0.136	0.004				100g
JCRM R404	Quartz powder	＞99.99	*11*	*0.6*	*6*		*0.2*	*(<0.1)*	*(1)*	*(0.4)*				*(<0.2)*	0.00	Italic type: 100g
JCRM R405	Silica powder	97.78	1.07	0.053	0.022		0.029	0.023	0.060	0.71			(0.00)	*2*	0.13	mass ppm 100g
JCRM R406	Silica powder	96.71	1.31	0.102	0.565		0.016	0.005	0.029	0.13			0.23	*8*	0.97	100g
JCRM R501	Zircon Sand	32.6	0.39	0.06	0.16	66.5									0.11	100g
JCRM R502	Zircon Sand	32.8	5.87	0.10	0.24	60.4									0.26	100g
JCRM R651	Aluminous Shale	21.74	71.7	1.48	3.15	0.18	0.19	0.10	0.03	0.65	0.19				0.59	100g
JCRM R802	Pyrophllite	60.7	32.3	0.23	0.185		0.04	0.004	0.09	0.06	0.05				6.0	50g
JCRM R901	Talc	59.77	0.924	1.224	0.019		0.438	31.22	0.054	0.004	0.195	0.004			6.14	50g
JCRM R902	Talc	60.77	0.115	0.091	0.004		0.342	31.97	0.006	0.003	0.046	(0.002)			6.64	50g
JCRM R903	Talc	55.76	2.447	0.564	0.075		0.998	31.84	0.029	0.007	0.051	(0.003)			8.23	50g

( ): Reference value

Reference Material		Chemical Composition (mass %)																	
Nonoxide Material		T.Si	T.C	F.C	O	N	Al	Fe	Ca	Mg	Ti	V	Cr	Ni	Zr	Mn	Cu	Mo	F
JCRM R024	Silicon Carbide Powder	68.97	29.85	0.423	0.97	0.048	0.0193	0.0219	0.0019	0.0002	0.0340	0.0013	0.0056	0.0060	0.0047	0.0004			
JCRM R025	Silicon Carbide Powder	68.43	30.49	1.24	0.94	0.113	0.0184	0.0233	0.0008		0.0040	0.0053	0.0097	0.0011	0.0012		0.0021	0.0126	
JCRM R026	Silicon Carbide Powder	69.03	29.85		0.71	0.034	0.0059	0.0011	0.0004		0.0016	0.0018							0.0686

Unit size: each 50g

Reference Material		Chemical Composition (mass %)																Size
Nonoxide Material		T.Si	T.N	O	C	Fe	Al	Ca	F	Cl	Ti	Mg	Cr	Mn	Ni	Cu	Zr	
JCRM R006	Silicon Nitride Powder	59.57	38.98	1.18	0.101	0.0012	<0.002	<0.0003	(0.0060)	(0.0045)	<0.0004	<0.0002	<0.0006	<0.0001	<0.0008	<0.0006	<0.0007	20g
JCRM R007	Silicon Nitride Powder	59.45	39.13	(0.85)	0.136	0.0169	0.0707	0.0931	(0.0532)	(0.0065)	0.0058	0.0068	0.0049	0.0028	<0.0008	<0.0006	<0.0007	20g
JCRM R008	Silicon Nitride Powder	59.03	38.46	1.56	0.097	0.171	0.116	0.225	(0.105)	<0.002	0.0072	0.0012	0.0092	0.0086	<0.0008	<0.0006	0.0009	20g

( ): Reference value

Reference Material		Chemical Composition (mass %)													Size
		SiO2	Al2O3	Fe2O3	TiO2	MnO	P2O5	CaO	MgO	Na2O	K2O	Nb2O5	HfO2	S	Ig. loss	
Oxide Powder Material																
JCRM R051	Zirconia powder	(0.005)		0.0017	(0.0005)			0.0017	0.0004	0.015			1.96		0.71	50g
JCRM R052	Zirconia powder	0.019		(0.0004)	0.0012			0.019	0.0042	0.0021	0.0013		1.81		0.25	50g
JCRM R053	Zirconia powder	0.036		0.030	0.127			0.021	0.0020	0.028	(0.0007)	0.054	1.67		0.65	50g
JCRM R054	Zirconia powder	0.300	0.136	0.132	0.136			0.535	0.208	0.0027	(0.0003)	0.427	1.60		0.15	50g
JCRM R604	Gairome Clay	47.88	35.37	1.357	0.865	0.006	0.020	0.216	0.251	0.083	0.468			(0.014)	13.37	50g
JCRM R605	Caolin	49.77	35.64	0.283	0.068		0.105	0.004	0.004	0.032	(0.008)			(0.023)	13.90	50g
JCRM R751	Pottery Stone	79.32	14.15	0.340	0.010	0.003	0.009	0.033	0.049	0.121	(3.00)			(0.0010)	2.73	50g
JCRM R702	Albite	67.69	19.64	0.058	0.030	0.004	0.139	0.546	0.103	11.31	0.137				0.23	50g
JCRM R703	Potassiumfeldspar	66.99	17.93	0.082	0.005	0.003	0.008	0.095	0.040	3.32	11.02				0.36	50g
JCRM R803	Pyrophyllite	68.52	23.95	0.047	0.104	0.0014	0.018	0.033	0.017	0.165	2.32			0.02	4.40	50g

( ): Reference value

Reference Material		Chemical Composition (mass %)												Size
		SiO2	CaO	Na2O	K2O	Ga2O3	Fe2O3	TiO2	MgO	ZrO2	SO3	NiO	CuO	
Oxide Powder Material														
JCRM R034	Alumina fine powder	0.0045	0.0002	0.0018	0.0020	0.0021	(0.0003)	(<0.0002)	(<0.0001)	(<0.0002)	(<0.0007)	(<0.0004)	(<0.0003)	
JCRM R035	Alumina fine powder	0.0116	0.0188	0.222	0.0005	0.0074	0.0151	0.0029	0.0013	0.0009	(0.0011)	(<0.0004)	0.0018	
JCRM R036	Alumina fine powder	0.0569	0.0242	0.0316	(0.0002)	0.0076	0.0139	0.0032	0.0006	0.0004	(<0.0007)	(<0.0004)	(<0.0003)	
Continue		ZnO	SrO	B2O3	Cl								Ig. loss	
JCRM R034	Alumina fine powder	(<0.0002)	(<0.0001)	(<0.0006)	(<0.0004)								0.188	50g
JCRM R035	Alumina fine powder	0.0012	0.0007	(<0.0006)	(<0.0004)								0.156	50g
JCRM R036	Alumina fine powder	0.0007	0.0002	0.0533	(<0.0004)								0.072	50g

( ): Reference value

Reference Material		Chemical Composition (mass %)									Size
Borosilicate Glass		SiO2	Al2O3	Fe2O3	TiO2	ZrO2	Na2O	K2O	B2O3	Cl	
JCRM R102	Borosilicate Glass	80.5	2.27	0.033	0.011	0.032	3.99	0.029	12.7	0.057	50g