

Table S1. Electronic probe composition analysis (EPMA) data (wt %)

Chlorite Type	Spot No.	SiO ₂	MgO	FeO	Al ₂ O ₃	Na ₂ O	K ₂ O	CaO	Total	Na+K+Ca
Chl1-Y	Y15-25-1	24.15	8.62	37.00	18.79	0.03	0.11	0.04	88.73	0.18
	Y15-25-2	24.30	8.67	34.70	20.09	0.01	0.01	0.33	88.12	0.36
	Y15-25-3	24.10	8.45	37.50	18.62	0.02	0.05	0.34	89.08	0.41
	Y15-25-4	24.03	7.40	40.09	17.11	0.02	0.06	0.25	88.97	0.33
	Y15-8-1	24.48	7.59	39.00	17.33	0.02	0.06	0.38	88.85	0.45
	Y15-8-2	23.89	7.44	38.80	16.67	0.01	0.04	0.32	87.18	0.37
	Y15-8-3	23.69	8.31	38.50	17.51	0.02	0.21	0.10	88.33	0.33
	Y15-8-4	24.32	7.67	37.70	17.26	0.01	0.09	0.30	87.36	0.40
	Y265-5-1	28.58	7.48	35.36	19.26	0.02	0.02	0.09	90.81	0.13
	Y265-5-2	27.58	7.51	34.40	20.12	0.02	0.02	0.08	89.73	0.12
	Y265-5-3	26.37	8.17	34.90	19.38	0.02	0.02	0.07	88.92	0.11
	Y265-5-4	26.31	7.47	33.70	20.09	0.02	0.01	0.09	87.68	0.12
	Y265-40-5	27.14	7.13	32.62	19.05	0.02	0.02	0.10	86.09	0.15
	Y265-40-6	26.59	7.69	33.00	19.24	0.02	0.02	0.09	86.65	0.13
	Y265-40-7	26.70	7.86	33.00	19.38	0.02	0.01	0.07	87.04	0.10
Chl1-Z	Z15-166-1	25.90	5.44	38.44	18.72	0.08	0.03	0.01	88.62	0.12
	Z15-166-2	25.14	5.23	38.02	18.47	0.03	0.01	0.00	86.90	0.04
	Z15-166-3	25.31	5.14	39.20	18.37	0.00	0.04	0.00	88.06	0.04
	Z15-128-1	25.49	5.65	34.53	20.55	0.02	0.00	0.04	86.28	0.06
	Z15-128-2	25.18	4.84	35.12	19.84	0.04	0.14	0.09	85.25	0.27
	Z15-128-3	24.71	3.82	37.24	19.96	0.39	0.10	0.04	86.26	0.53
	Z15-128-4	25.50	5.93	34.84	20.22	0.22	0.03	0.05	86.79	0.30
	64-14-46-1	24.82	4.89	38.80	20.76	0.02	0.01	0.03	89.32	0.06
	64-14-46-2	23.85	4.33	40.80	19.08	0.01	0.23	0.11	88.41	0.35

	64-14-46-3	23.49	5.14	40.20	20.58	0.01	0.29	0.06	89.77	0.36
	64-14-46-4	24.20	4.40	39.60	20.09	0.01	0.29	0.14	88.72	0.44
	64-14-52-1	25.12	4.94	39.70	19.29	0.02	0.19	0.14	89.39	0.34
	64-14-52-2	27.39	4.62	38.10	19.38	0.03	0.27	0.06	89.84	0.36
	64-14-52-3	25.21	4.92	39.50	18.91	0.02	0.17	0.04	88.78	0.24
	64-14-52-4	23.24	4.88	40.70	20.12	0.03	0.38	0.05	89.41	0.46
Chl2	Y15-4-1	27.87	13.24	29.63	17.61	0.04	0.02	0.41	88.82	0.47
	Y15-4-2	27.64	13.47	29.63	17.12	0.08	0.03	0.30	88.27	0.41
	Y15-4-3	27.25	12.96	30.09	17.87	0.05	0.03	0.15	88.40	0.23
	Y15-4-4	27.69	13.89	30.54	17.78	0.03	0.01	0.15	90.09	0.19
	Y15-4-5	28.99	15.73	22.53	19.07	0.00	0.00	0.16	86.48	0.16
	Y15-4-6	28.80	16.05	22.27	19.55	0.05	0.01	0.12	86.85	0.18
	Y15-16-1	28.73	13.78	25.75	18.50	0.04	0.16	0.16	87.12	0.36
	Y15-16-2	28.00	14.08	25.57	17.66	0.09	0.03	0.14	85.57	0.26
	Y15-16-4	28.17	14.38	24.99	19.36	0.06	0.02	0.13	87.11	0.21
	Y15-16-5	28.71	13.65	24.22	20.10	0.04	0.00	0.15	86.87	0.19
	Y15-16-6	28.15	13.72	24.56	19.51	0.01	0.02	0.20	86.17	0.23
	Y15-23-1	29.32	14.66	23.99	18.21	0.06	0.00	0.33	86.57	0.39
	Y15-23-2	28.93	14.41	24.33	18.71	0.06	0.00	0.24	86.68	0.30
	Y265-1-1	26.44	9.39	30.12	20.16	0.06	0.00	0.14	86.31	0.20
	Y265-1-2	26.37	9.38	29.64	20.07	0.06	0.00	0.15	85.67	0.21
	Y265-1-3	26.24	9.25	30.55	20.23	0.03	0.00	0.18	86.48	0.21
	Y265-1-4	26.69	10.10	31.39	20.28	0.01	0.00	0.05	88.52	0.06
	Y265-1-5	26.11	9.63	31.15	20.67	0.06	0.00	0.09	87.71	0.15
	Y265-46-1	30.48	13.96	22.58	20.20	0.01	0.21	0.11	87.55	0.33

	Y265-46-2	29.87	13.71	24.08	20.05	0.04	0.17	0.16	88.08	0.37
	Y265-46-3	29.39	13.69	23.13	20.37	0.03	0.22	0.12	86.95	0.37
	Y15-10-1	29.90	14.70	23.35	18.72	0.00	0.03	0.18	86.88	0.21
	Y15-10-2	29.11	14.47	25.19	19.05	0.00	0.02	0.14	87.98	0.16
	Y15-10-3	28.43	14.85	23.94	19.26	0.01	0.00	0.16	86.65	0.17
	Y15-10-4	29.24	14.99	24.45	19.05	0.00	0.00	0.14	87.87	0.14
	Y265-31-1	28.95	11.81	26.52	20.20	0.12	0.04	0.17	87.81	0.33
	Y265-31-2	27.76	11.42	27.85	20.15	0.03	0.03	0.13	87.37	0.19
	Y265-31-3	29.59	10.41	26.03	20.48	0.22	0.00	0.16	86.89	0.38
	Y265-31-4	27.28	10.88	29.60	19.08	0.04	0.00	0.08	86.96	0.12
Chl3	Z15-56-1	25.28	5.82	38.37	19.69	0.00	0.09	0.27	89.52	0.36
	Z15-56-2	26.74	5.77	41.73	16.60	0.05	0.02	0.28	91.19	0.35
	Z15-136-1	26.26	6.04	41.82	17.67	0.10	0.14	0.15	92.18	0.39
	Z15-136-2	26.41	5.99	40.84	18.33	0.14	0.25	0.10	92.06	0.49
	Z15-136-3	25.20	5.53	37.44	18.36	0.11	0.05	0.30	86.99	0.46
	Z-170-4-1	23.60	2.86	43.26	19.28	0.05	0.03	0.10	89.18	0.18
	Z-170-4-2	25.94	3.62	44.58	17.51	0.00	0.00	0.11	91.76	0.11
	Z-170-4-3	25.41	3.68	43.95	18.24	0.00	0.14	0.06	91.48	0.20
	Z15-199-1	27.57	5.90	40.67	16.64	0.17	0.16	0.15	91.26	0.48
	Z15-199-2	27.12	6.23	41.53	15.43	0.11	0.07	0.29	90.78	0.47
	Z15-199-3	27.39	6.49	40.68	15.77	0.09	0.10	0.27	90.79	0.46
	Z15-207-2	27.15	8.75	34.56	19.00	0.00	0.05	0.14	89.65	0.19
	Z15-207-3	27.55	8.39	34.84	18.46	0.00	0.22	0.18	89.64	0.40
	ZK61-14-33-1	24.82	3.52	44.60	18.81	0.11	0.09	0.06	92.01	0.26
	ZK61-14-33-2	25.10	4.71	42.97	18.95	0.06	0.05	0.09	91.93	0.20

ZK61-14-67-1	23.73	3.32	44.98	17.12	0.11	0.02	0.06	89.34	0.19
ZK61-14-67-2	24.63	3.65	46.33	17.92	0.04	0.01	0.10	92.68	0.15
ZK61-14-67-3	24.23	3.90	44.26	18.39	0.02	0.04	0.06	90.90	0.12
ZK61-14-67-4	25.11	3.91	38.26	19.72	0.06	0.02	0.07	87.15	0.15
ZK61-14-67-5	24.31	3.73	38.66	19.79	0.07	0.04	0.31	86.91	0.42
ZK61-14-68-1	24.56	3.81	45.08	18.56	0.06	0.01	0.04	92.12	0.11
ZK61-14-68-2	24.84	3.86	45.35	17.75	0.00	0.00	0.02	91.82	0.02
Z-250-33-1	23.99	2.60	45.87	19.57	0.00	0.06	0.07	92.16	0.13
Z-250-33-2	23.97	2.36	46.60	19.10	0.00	0.09	0.07	92.19	0.16
Z-250-33-3	24.36	2.93	46.18	19.44	0.09	0.02	0.10	93.12	0.21
Z-250-33-4	24.87	2.51	40.77	19.81	0.05	0.02	0.12	88.15	0.19
Z-250-33-5	24.63	2.78	39.22	20.21	0.04	0.01	0.36	87.25	0.41
Z-250-15-1	24.10	2.51	40.11	20.62	0.00	0.00	0.00	87.34	0.00
Z-250-15-2	23.94	2.88	40.28	20.31	0.08	0.00	0.07	87.56	0.15
Z-250-15-3	24.74	4.69	36.23	22.01	0.00	0.00	0.02	87.69	0.02
Z-250-15-4	23.73	2.46	38.71	21.78	0.02	0.00	0.07	86.77	0.09
Z15-254-2	25.54	4.77	38.26	19.37	0.06	0.02	0.04	88.06	0.12
Z15-254-3	26.52	5.49	36.89	18.87	0.00	0.03	0.09	87.89	0.12

The major element data of Chl2 are from Wang et al. (2018)

Table S2. Calculated cation numbers of chlorites and recalculated temperatures of Xiangshan chlorite (at standard of 14 oxygen atoms)

Chlorite Type	No.	Si	Mg	Fe	Al	Na	K	Ca	Al ^{IV}	Al ^{VI}	Fe/(Fe+Mg)	Fe+Al ^{VI}	d001(0.1nm)	t _{d001} (°C)
Chl1-Y	Y15-25-1	2.69	1.43	3.45	2.47	0.01	0.02	0.00	1.305	1.167	0.707	4.62	14.120	259.5
	Y15-25-2	2.69	1.43	3.21	2.62	0.00	0.00	0.04	1.310	1.312	0.692	4.53	14.124	255.2

	Y15-25-3	2.69	1.40	3.50	2.45	0.01	0.01	0.04	1.312	1.137	0.714	4.64	14.118	261.2
	Y15-25-4	2.73	1.25	3.81	2.29	0.00	0.01	0.03	1.269	1.023	0.752	4.83	14.116	262.5
	Y15-8-1	2.76	1.28	3.68	2.31	0.00	0.01	0.05	1.236	1.071	0.743	4.75	14.123	256.1
	Y15-8-2	2.76	1.28	3.75	2.27	0.00	0.01	0.04	1.240	1.031	0.745	4.78	14.121	257.9
	Y15-8-3	2.69	1.41	3.66	2.34	0.00	0.03	0.01	1.307	1.038	0.722	4.70	14.115	263.9
	Y15-8-4	2.78	1.31	3.60	2.32	0.00	0.01	0.04	1.221	1.103	0.734	4.71	14.126	252.8
	Y265-5-1	3.03	1.18	3.13	2.41	0.00	0.00	0.01	0.970	1.436	0.726	4.57	14.164	214.6
	Y265-5-2	2.95	1.20	3.08	2.54	0.00	0.00	0.01	1.048	1.489	0.720	4.57	14.157	222.4
	Y265-5-3	2.87	1.33	3.18	2.49	0.00	0.00	0.01	1.127	1.362	0.705	4.54	14.146	233.5
	Y265-5-4	2.89	1.22	3.09	2.60	0.00	0.00	0.01	1.113	1.486	0.717	4.58	14.149	230.1
	Y265-40-5	3.02	1.18	3.03	2.49	0.00	0.00	0.01	0.985	1.509	0.719	4.54	14.165	214.1
	Y265-40-6	2.95	1.27	3.06	2.51	0.00	0.00	0.01	1.054	1.457	0.707	4.51	14.156	222.7
	Y265-40-7	2.94	1.29	3.04	2.52	0.00	0.00	0.01	1.058	1.458	0.702	4.50	14.156	222.8
Chl1-Z	Z15-166-1	2.89	0.91	3.59	2.47	0.02	0.00	0.00	1.105	1.361	0.799	4.95	14.140	239.3
	Z15-166-2	2.87	0.89	3.63	2.49	0.01	0.00	0.00	1.128	1.358	0.803	4.99	14.136	242.8
	Z15-166-3	2.87	0.87	3.71	2.45	0.00	0.01	0.00	1.132	1.321	0.811	5.03	14.134	244.9
	Z15-128-1	2.86	0.95	3.24	2.72	0.00	0.00	0.00	1.138	1.582	0.774	4.82	14.143	236.0
	Z15-128-2	2.88	0.83	3.36	2.68	0.01	0.02	0.01	1.116	1.562	0.803	4.93	14.143	236.0
	Z15-128-3	2.83	0.65	3.57	2.70	0.09	0.01	0.00	1.165	1.534	0.845	5.11	14.133	245.8
	Z15-128-4	2.86	0.99	3.26	2.67	0.05	0.00	0.01	1.144	1.525	0.767	4.79	14.142	237.2
	64-14-46-1	2.75	0.81	3.60	2.72	0.00	0.00	0.00	1.245	1.470	0.817	5.07	14.123	255.6
	64-14-46-2	2.73	0.74	3.91	2.57	0.00	0.03	0.01	1.269	1.305	0.841	5.21	14.115	264.5
	64-14-46-3	2.63	0.86	3.77	2.72	0.00	0.04	0.01	1.367	1.351	0.814	5.12	14.106	273.0
	64-14-46-4	2.73	0.74	3.74	2.67	0.00	0.04	0.02	1.266	1.408	0.835	5.15	14.118	260.8
	64-14-52-1	2.81	0.82	3.71	2.54	0.00	0.03	0.02	1.191	1.352	0.818	5.06	14.127	251.6
	64-14-52-2	2.99	0.75	3.48	2.50	0.01	0.04	0.01	1.005	1.492	0.822	4.98	14.153	225.6

	64-14-52-3	2.84	0.83	3.72	2.51	0.00	0.03	0.01	1.163	1.345	0.818	5.06	14.131	248.5
	64-14-52-4	2.63	0.82	3.85	2.68	0.01	0.06	0.01	1.370	1.314	0.824	5.17	14.104	274.9
Chl2	Y15-4-1	2.96	2.10	2.63	2.20	0.01	0.00	0.05	1.041	1.162	0.557	3.79	14.166	212.6
	Y15-4-2	2.96	2.15	2.65	2.16	0.02	0.00	0.03	1.042	1.117	0.552	3.77	14.166	213.1
	Y15-4-3	2.92	2.07	2.69	2.25	0.01	0.00	0.02	1.083	1.171	0.566	3.86	14.160	218.7
	Y15-4-4	2.91	2.18	2.68	2.20	0.01	0.00	0.02	1.091	1.111	0.552	3.79	14.160	219.4
	Y15-4-5	3.03	2.45	1.97	2.35	0.00	0.00	0.02	0.975	1.371	0.446	3.34	14.187	191.6
	Y15-4-6	2.99	2.48	1.93	2.39	0.01	0.00	0.01	1.011	1.380	0.438	3.31	14.184	195.1
	Y15-16-1	3.03	2.17	2.27	2.30	0.01	0.02	0.02	0.966	1.337	0.512	3.61	14.182	196.8
	Y15-16-2	3.02	2.26	2.31	2.24	0.02	0.00	0.02	0.981	1.263	0.505	3.57	14.180	199.2
	Y15-16-4	2.96	2.25	2.20	2.40	0.01	0.00	0.01	1.037	1.363	0.494	3.56	14.176	203.5
	Y15-16-5	3.01	2.13	2.12	2.48	0.01	0.00	0.02	0.995	1.484	0.499	3.60	14.182	197.0
	Y15-16-6	2.99	2.17	2.18	2.44	0.00	0.00	0.02	1.015	1.424	0.501	3.60	14.179	200.5
	Y15-23-1	3.08	2.30	2.11	2.26	0.01	0.00	0.04	0.917	1.339	0.479	3.45	14.191	187.9
	Y15-23-2	3.04	2.26	2.14	2.32	0.01	0.00	0.03	0.957	1.363	0.486	3.50	14.186	193.0
	Y265-1-1	2.89	1.53	2.76	2.60	0.01	0.00	0.02	1.106	1.494	0.643	4.25	14.156	222.6
	Y265-1-2	2.90	1.54	2.73	2.60	0.01	0.00	0.02	1.098	1.505	0.639	4.23	14.158	221.1
	Y265-1-3	2.87	1.51	2.80	2.61	0.01	0.00	0.02	1.126	1.486	0.649	4.28	14.153	225.7
	Y265-1-4	2.86	1.61	2.81	2.56	0.00	0.00	0.01	1.139	1.423	0.636	4.24	14.151	227.5
	Y265-1-5	2.83	1.55	2.82	2.64	0.01	0.00	0.01	1.173	1.464	0.645	4.28	14.147	231.6
	Y265-46-1	3.12	2.13	1.93	2.44	0.00	0.03	0.01	0.877	1.563	0.476	3.50	14.199	179.7
	Y265-46-2	3.07	2.10	2.07	2.43	0.01	0.02	0.02	0.927	1.504	0.496	3.58	14.191	188.2
	Y265-46-3	3.05	2.12	2.01	2.49	0.01	0.03	0.01	0.949	1.544	0.487	3.55	14.190	189.5
	Y15-10-1	3.11	2.28	2.03	2.30	0.00	0.00	0.02	0.889	1.407	0.471	3.44	14.196	183.1
	Y15-10-2	3.03	2.24	2.19	2.33	0.00	0.00	0.02	0.974	1.359	0.494	3.55	14.183	196.1

	Y15-10-3	2.99	2.33	2.10	2.38	0.00	0.00	0.02	1.013	1.372	0.475	3.48	14.180	198.8
	Y15-10-4	3.03	2.32	2.12	2.33	0.00	0.00	0.02	0.970	1.357	0.478	3.48	14.185	194.1
	Y265-31-1	3.03	1.84	2.32	2.49	0.02	0.01	0.02	0.969	1.524	0.557	3.85	14.181	198.1
	Y265-31-2	2.95	1.81	2.48	2.53	0.01	0.00	0.01	1.048	1.478	0.578	3.95	14.169	210.3
	Y265-31-3	3.11	1.63	2.29	2.54	0.04	0.00	0.02	0.887	1.653	0.584	3.94	14.191	188.0
	Y265-31-4	2.95	1.75	2.68	2.43	0.01	0.00	0.01	1.048	1.385	0.604	4.06	14.165	214.4
Chl3	Z15-56-1	2.80	0.96	3.55	2.57	0.00	0.01	0.03	1.202	1.367	0.787	4.92	14.129	249.6
	Z15-56-2	2.95	0.95	3.86	2.16	0.01	0.00	0.03	1.045	1.117	0.802	4.97	14.141	237.7
	Z15-136-1	2.87	0.98	3.82	2.28	0.02	0.02	0.02	1.130	1.147	0.795	4.97	14.132	246.7
	Z15-136-2	2.87	0.97	3.71	2.35	0.03	0.03	0.01	1.127	1.222	0.793	4.94	14.135	244.3
	Z15-136-3	2.87	0.94	3.57	2.47	0.02	0.01	0.04	1.129	1.337	0.792	4.90	14.137	241.5
	Z-170-4-1	2.71	0.49	4.15	2.61	0.01	0.00	0.01	1.290	1.320	0.895	5.48	14.107	271.8
	Z-170-4-2	2.89	0.60	4.15	2.30	0.00	0.00	0.01	1.109	1.190	0.874	5.34	14.128	251.1
	Z-170-4-3	2.84	0.61	4.10	2.40	0.00	0.02	0.01	1.165	1.234	0.870	5.34	14.123	256.4
	Z15-199-1	3.02	0.96	3.73	2.15	0.04	0.02	0.02	0.980	1.169	0.795	4.89	14.151	227.6
	Z15-199-2	3.01	1.03	3.86	2.02	0.02	0.01	0.03	0.987	1.034	0.789	4.89	14.148	231.0
	Z15-199-3	3.02	1.07	3.76	2.05	0.02	0.01	0.03	0.976	1.076	0.779	4.83	14.151	227.7
	Z15-207-2	2.92	1.40	3.11	2.41	0.00	0.01	0.02	1.077	1.335	0.689	4.45	14.153	226.4
	Z15-207-3	2.97	1.35	3.14	2.35	0.00	0.03	0.02	1.026	1.322	0.700	4.47	14.158	221.3
	ZK61-14-33-1	2.77	0.58	4.16	2.47	0.02	0.01	0.01	1.235	1.235	0.877	5.39	14.113	265.5
	ZK61-14-33-2	2.77	0.77	3.97	2.47	0.01	0.01	0.01	1.230	1.235	0.837	5.20	14.118	261.1
	ZK61-14-67-1	2.76	0.58	4.37	2.34	0.02	0.00	0.01	1.242	1.102	0.884	5.47	14.108	270.7
	ZK61-14-67-2	2.75	0.61	4.33	2.36	0.01	0.00	0.01	1.248	1.113	0.877	5.44	14.108	270.5
	ZK61-14-67-3	2.74	0.66	4.18	2.45	0.00	0.01	0.01	1.262	1.187	0.864	5.37	14.110	269.2
	ZK61-14-67-4	2.86	0.66	3.64	2.64	0.01	0.00	0.01	1.143	1.501	0.846	5.14	14.134	244.6

ZK61-14-67-5	2.79	0.64	3.71	2.68	0.02	0.01	0.04	1.209	1.470	0.853	5.18	14.125	253.6
ZK61-14-68-1	2.74	0.63	4.21	2.44	0.01	0.00	0.00	1.258	1.183	0.869	5.39	14.110	269.3
ZK61-14-68-2	2.79	0.65	4.26	2.35	0.00	0.00	0.00	1.213	1.135	0.868	5.39	14.114	265.0
Z-250-33-1	2.69	0.43	4.30	2.58	0.00	0.01	0.01	1.312	1.273	0.908	5.57	14.102	277.2
Z-250-33-2	2.70	0.40	4.39	2.53	0.00	0.01	0.01	1.301	1.234	0.917	5.62	14.101	277.8
Z-250-33-3	2.70	0.48	4.28	2.54	0.02	0.00	0.01	1.299	1.241	0.898	5.52	14.104	275.5
Z-250-33-4	2.84	0.43	3.89	2.66	0.01	0.00	0.01	1.164	1.498	0.901	5.39	14.127	252.0
Z-250-33-5	2.82	0.47	3.75	2.73	0.01	0.00	0.04	1.182	1.543	0.888	5.30	14.128	251.4
Z-250-15-1	2.77	0.43	3.85	2.79	0.00	0.00	0.00	1.233	1.557	0.900	5.41	14.120	259.2
Z-250-15-2	2.75	0.49	3.87	2.75	0.02	0.00	0.01	1.251	1.498	0.887	5.37	14.117	261.6
Z-250-15-3	2.76	0.78	3.37	2.89	0.00	0.00	0.00	1.245	1.644	0.813	5.02	14.128	251.0
Z-250-15-4	2.72	0.42	3.71	2.94	0.00	0.00	0.01	1.279	1.664	0.898	5.38	14.117	261.7
Z15-254-2	2.87	0.80	3.60	2.57	0.01	0.00	0.00	1.129	1.437	0.818	5.03	14.137	242.1
Z15-254-3	2.96	0.91	3.44	2.48	0.00	0.00	0.01	1.043	1.437	0.790	4.88	14.150	229.1

Table S3. LA-ICP-MS trace elements data of chlorite at Xiangshan (ppm)

No.	Ti	Mn	Sc	V	Cr	Co	Ni	Zn	Ga	Rb	Sr	La	Ce	Pr
Y15-25-1	2071	12102	46.3	171	46.6	43.2	44.4	839	74.3	20.9	26.9	31.4	47.2	5.66
Y15-25-2	979	13360	10.4	135	45.7	44.7	47.0	882	81.7	1.01	10.5	3.11	3.83	0.71
Y15-25-3	1600	11498	32.5	180	19.4	46.5	47.3	792	72.7	2.83	12.3	5.81	9.53	1.70
Y15-25-4	919	10562	47.8	216	19.4	40.5	38.9	658	63.7	2.21	18.6	7.24	9.67	1.78
Y15-25-5	884	10628	52.8	214	15.5	41.8	40.6	662	66.1	9.35	14.9	8.46	14.2	2.14
Y15-25-6	816	13843	63.7	105	24.1	36.4	36.0	880	71.0	2.90	12.5	5.85	7.11	1.49
Y15-25-7	770	15274	24.0	89.7	12.8	40.6	39.5	985	83.4	18.2	17.0	3.95	5.03	0.93
Y15-25-8	1496	14098	50.2	113	16.5	42.5	34.2	936	84.3	8.94	31.6	74.7	158	16.8
Y265-5-1	389	8392	12.9	219	120	44.6	31.9	696	65.8	220	22.4	6.52	22.1	2.74

Y265-5-2	273	8780	11.4	211	127	46.3	34.1	720	67.7	188	21.4	3.93	15.5	1.85
Y265-5-3	932	9549	10.8	195	152	47.3	36.4	732	69.6	198	22.8	5.48	18.9	2.12
Y265-5-4	826	8769	10.1	202	138	48.4	34.6	772	68.0	160	20.6	2.79	11.8	1.39
Y265-5-5	655	7763	15.3	240	186	43.8	35.1	676	64.9	241	25.9	7.81	32.3	3.63
Y265-5-6	618	8802	16.0	279	167	45.0	29.4	719	72.6	244	22.8	4.57	20.0	2.29
Y265-5-7	1678	9578	7.88	173	75.5	49.7	31.1	747	64.1	130	19.0	1.48	6.51	0.84
64-14-46-1	560	7231	28.0	46.2	3.90	35.2	40.3	1054	103	200	10.6	5.78	11.8	1.22
64-14-46-2	1133	13387	56.5	41.8	5.90	30.6	37.8	890	92.1	112	36.3	11.8	20.9	2.22
64-14-46-3	714	9678	23.2	57.0	6.79	35.0	41.4	1035	96.7	56.4	6.06	6.14	16.2	1.60
64-14-46-4	796	9842	36.1	47.5	4.51	32.4	34.7	889	91.3	185	26.0	9.68	23.3	2.66
64-14-52-1	2102	15084	22.0	49.9	5.85	32.9	36.9	1008	118	153	16.9	8.57	22.5	2.55
64-14-52-2	866	12952	20.4	46.3	8.34	32.5	30.9	961	106	138	9.54	0.81	3.66	0.56
64-14-52-3	1414	22781	54.2	68.2	13.7	37.6	32.9	880	111	152	18.1	13.8	34.6	4.18
64-14-52-4	545	17876	39.2	42.0	8.82	37.9	30.5	966	114	98.5	37.6	30.0	51.0	3.59
Y15-4-1	620	3418	19.9	150	184	45.4	217	1145	84.2	3.83	15.8	0.43	0.41	0.085
Y15-4-2	496	2784	15.3	158	132	49.4	236	1194	84.2	2.86	12.9	0.27	0.25	0.056
Y15-4-4	361	2851	16.1	159	119	50.4	231	1220	84.9	3.25	11.7	0.066	0.073	0.020
Y15-4-5	565	3552	19.5	141	69.6	37.2	159	980	76.4	5.08	44.8	1.16	2.37	0.33
Y15-4-6	157	2799	16.4	156	137	47.0	232	1125	82.1	3.94	12.1	0.035	0.038	0.0075
Y15-16-1	172	2802	15.4	150	116	44.9	206	1121	84.2	3.43	10.5	0.047	0.046	0.013
Y15-16-2	210	2890	15.5	146	116	39.9	180	1073	80.4	5.14	11.8	0.052	0.041	0.016
Y15-16-3	183	3657	12.8	153	99.2	43.5	205	1146	81.6	2.48	7.61	0.033	0.057	0.016
Y15-16-4	141	3466	13.7	145	149	40.6	195	1090	82.1	3.00	8.11	0.054	0.10	0.0061
Y15-16-5	154	3672	14.3	146	133	42.5	192	1073	80.8	2.51	7.40	0.049	0.075	0.015
Y15-23-1	195	2990	16.2	159	139	47.3	222	1148	84.1	2.81	7.67	0.044	0.069	0.016
Y15-23-2	131	4510	15.1	135	150	33.5	139	985	77.3	1.51	7.08	0.61	0.10	0.0060

Y15-23-3	237	3555	15.5	160	129	43.4	210	1102	86.5	2.49	11.8	0.12	0.15	0.021
Y15-23-4	108	3935	19.5	139	94.2	33.3	130	931	78.1	4.29	17.3	0.099	0.058	0.026
Y15-23-5	150	3051	17.5	169	180	44.0	202	1124	87.8	4.01	16.8	0.12	0.076	0.031
Y265-1-1	123	4321	22.3	314	96.1	26.5	144	1116	120	0.36	7.76	0.35	0.67	0.052
Y265-1-2	122	3240	20.4	310	82.2	26.1	147	1080	126	0.33	8.22	0.31	0.52	0.048
Y265-1-3	119	3756	20.1	302	72.3	27.1	149	1067	128	0.42	7.92	0.25	0.53	0.057
Y265-1-4	142	5789	28.9	297	63.0	24.7	128	1074	119	0.22	7.31	0.37	1.08	0.11
Y265-1-5	105	3815	19.0	280	62.0	23.9	141	971	116	0.40	6.94	0.24	0.43	0.039
Y265-1-6	113	4052	19.2	285	69.2	24.6	142	1003	120	0.30	9.41	0.50	1.43	0.16
ZK61-14-67-1	435	4813	10.7	63	4.6	18.9	28.9	291	32	25.08	39.65	2.56	7.61	0.868
ZK61-14-67-2	281	4451	10.2	67	44.3	13.3	18.5	291	29	15.60	7.19	0.37	1.21	0.140
ZK61-14-67-3	521	5366	10.8	69	13.3	28.8	48.9	361	31	23.55	21.20	2.74	8.24	0.919
ZK61-14-67-4	401	3981	12.0	74	27.5	21.6	34.2	294	30	42.28	17.28	1.85	5.63	0.65
ZK61-14-68-1	255	4429	10.3	71	37.8	25.5	39.2	321	30	11.92	11.31	0.76	2.07	0.224
ZK61-14-68-2	356	4397	11.5	66	41.6	24.1	38.9	279	31	11.52	14.71	1.45	4.07	0.44
ZK61-14-68-3	245	4233	10.8	65	13.6	10.3	16.0	280	30	9.56	8.90	0.55	1.59	0.19
ZK61-14-68-4	279	5108	9.8	64	43.1	10.7	22.0	304	32	10.77	9.05	0.69	2.13	0.238
Z-250-33-1	210	6200	22.9	109	5.0	11.25	64.7	1054	31	1.88	7.36	0.17	0.33	0.049
Z-250-33-2	216	7389	15.6	108	32.4	11.30	55.0	1070	30	2.44	10.27	0.37	1.28	0.123
Z-250-33-3	243	6831	27.9	120	9.8	12.29	82.9	1071	28	1.34	5.33	0.09	0.52	0.096
Z-250-15-1	550	3567	16.1	131	136.0	20.6	28.9	1161	67	0.18	18.48	1.19	2.46	0.300
Z-250-15-2	140	3276	15.0	131	188.0	20.8	48.9	1176	68	0.39	20.33	1.17	2.50	0.255
No.	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Pb	Th	U
Y15-25-1	23.1	6.14	0.72	7.41	1.06	6.12	1.32	3.28	0.39	2.31	0.38	63.842	0.0025	1.94
Y15-25-2	3.33	0.88	0.19	0.97	0.14	0.85	0.25	0.78	0.11	0.79	0.096	20.141	0.0000	0.91
Y15-25-3	6.69	2.90	0.35	3.36	0.59	3.72	0.66	1.55	0.20	1.21	0.20	20.509	0.011	1.63

Y15-25-4	9.17	3.45	0.29	4.28	0.85	4.57	0.81	1.68	0.18	1.04	0.13	23.928	0.051	2.61
Y15-25-5	10.2	3.88	0.49	4.78	0.88	5.00	0.87	2.11	0.25	1.43	0.20	19.946	0.015	2.48
Y15-25-6	6.21	1.65	0.50	1.80	0.36	2.15	0.50	1.32	0.20	1.48	0.20	30.901	0.0045	1.37
Y15-25-7	3.78	0.81	0.17	0.60	0.12	0.69	0.17	0.39	0.057	0.52	0.067	33.36	0.019	0.65
Y15-25-8	53.9	7.64	1.09	4.88	0.79	4.79	1.00	2.81	0.41	2.55	0.44	60.08	0.014	1.79
Y265-5-1	11.1	3.43	0.32	3.33	0.70	4.14	0.78	2.10	0.27	1.49	0.18	12.308	10.8	16.0
Y265-5-2	7.57	2.55	0.22	2.08	0.55	3.40	0.70	1.62	0.22	1.25	0.13	9.468	4.20	12.1
Y265-5-3	8.89	2.77	0.29	2.64	0.57	4.06	0.77	1.86	0.25	1.46	0.19	11.37	5.99	15.3
Y265-5-4	5.38	2.09	0.22	2.04	0.45	2.67	0.52	1.09	0.15	1.13	0.11	9.279	3.34	10.2
Y265-5-5	14.7	5.05	0.58	4.62	1.07	6.93	1.25	3.08	0.42	2.39	0.26	22.16	10.3	30.7
Y265-5-6	9.16	3.07	0.36	3.05	0.62	4.00	0.81	1.80	0.23	1.47	0.18	17.53	7.87	23.6
Y265-5-7	3.27	1.21	0.10	1.16	0.25	1.33	0.27	0.56	0.14	0.71	0.077	6.525	1.83	6.07
64-14-46-1	4.83	1.37	0.11	2.33	0.48	3.20	0.65	1.75	0.33	1.86	0.27	15.533	0.75	3.06
64-14-46-2	9.18	3.75	0.096	4.96	1.37	10.1	2.27	7.20	1.03	7.38	0.95	21.733	4.73	9.30
64-14-46-3	6.04	1.80	0.062	2.02	0.46	3.52	0.86	2.29	0.32	2.09	0.28	4.786	2.38	0.65
64-14-46-4	8.39	2.81	0.14	3.48	0.85	6.38	1.46	4.26	0.70	4.11	0.62	30.37	2.02	1.67
64-14-52-1	11.5	3.84	0.086	3.21	0.57	3.67	0.70	2.19	0.32	2.37	0.35	6.41	1.05	4.37
64-14-52-2	2.61	1.26	0.0088	1.93	0.33	2.00	0.42	1.08	0.17	1.08	0.20	1.23	1.39	0.78
64-14-52-3	16.3	4.63	0.19	4.76	1.02	6.97	1.60	4.46	0.66	5.10	0.60	51.338	8.73	4.59
64-14-52-4	10.6	3.68	0.14	4.49	1.15	7.45	1.60	4.80	0.64	4.75	0.69	73.45	4.72	7.23
Y15-4-1	0.36	0.080	0.0000	0.17	0.044	0.41	0.11	0.35	0.060	0.34	0.039	3.6334	0.023	23.3
Y15-4-2	0.016	0.093	0.0085	0.11	0.044	0.30	0.071	0.15	0.053	0.24	0.042	3.0249	0.020	17.5
Y15-4-4	0.015	0.018	0.0000	0.035	0.024	0.10	0.027	0.093	0.023	0.20	0.022	2.291	0.0034	6.91
Y15-4-5	1.30	0.27	0.044	0.63	0.11	1.15	0.28	0.85	0.11	0.92	0.16	3.348	0.27	32.0
Y15-4-6	0.030	0.0000	0.0000	0.034	0.0096	0.052	0.0100	0.054	0.015	0.035	0.013	1.8318	0.0067	8.16
Y15-16-1	0.080	0.0000	0.0000	0.072	0.0082	0.088	0.014	0.080	0.0053	0.049	0.0028	2.306	0.018	8.01

Y15-16-2	0.049	0.057	0.0000	0.055	0.017	0.045	0.012	0.041	0.016	0.075	0.011	1.708	0.043	7.18
Y15-16-3	0.065	0.057	0.0000	0.055	0.0049	0.11	0.023	0.049	0.0000	0.062	0.0021	1.067	0.061	15.2
Y15-16-4	0.050	0.0000	0.0000	0.062	0.0095	0.050	0.013	0.056	0.012	0.11	0.0064	2.065	0.098	9.62
Y15-16-5	0.018	0.27	0.0000	0.041	0.0093	0.062	0.016	0.037	0.0030	0.096	0.013	2.1096	0.024	8.61
Y15-23-1	0.039	0.046	0.0000	0.044	0.0067	0.047	0.018	0.13	0.013	0.026	0.014	2.706	0.044	10.4
Y15-23-2	0.036	0.0000	0.0057	0.0000	0.013	0.14	0.026	0.074	0.0030	0.028	0.022	1.783	0.031	30.5
Y15-23-3	0.085	0.025	0.0000	0.048	0.018	0.15	0.031	0.076	0.025	0.15	0.019	3.446	0.028	15.1
Y15-23-4	0.079	0.031	0.0048	0.045	0.014	0.055	0.036	0.10	0.0066	0.13	0.023	4.9380	0.012	24.7
Y15-23-5	0.088	0.044	0.0005	0.057	0.020	0.14	0.036	0.097	0.0063	0.059	0.022	4.5172	0.011	47.7
Y265-1-1	0.29	0.074	0.0000	0.096	0.0036	0.12	0.011	0.011	0.014	0.049	0.0075	0.430	0.038	63.7
Y265-1-2	0.29	0.0000	0.011	0.084	0.025	0.051	0.017	0.038	0.0031	0.043	0.0066	0.3181	0.025	48.5
Y265-1-3	0.15	0.053	0.0000	0.034	0.010	0.094	0.013	0.038	0.010	0.058	0.0054	0.273	0.057	40.6
Y265-1-4	0.33	0.090	0.0048	0.092	0.018	0.067	0.016	0.039	0.0076	0.024	0.0082	0.2153	0.20	77.3
Y265-1-5	0.17	0.020	0.0000	0.071	0.017	0.058	0.0089	0.042	0.0000	0.026	0.0059	0.2515	0.0036	95.5
Y265-1-6	0.59	0.15	0.016	0.17	0.012	0.12	0.033	0.14	0.011	0.048	0.035	0.4971	0.026	167
ZK61-14-67-1	3.43	0.732	0.0775	1.136	0.1980	1.48	0.374	1.247	0.192	1.182	0.1939	8.498	28.830	901.1
ZK61-14-67-2	0.53	0.1501	0.023	0.259	0.044	0.311	0.121	0.267	0.0342	0.254	0.0393	4.5676	6.043	296.7
ZK61-14-67-3	3.31	0.883	0.0748	0.960	0.239	1.520	0.387	1.183	0.177	1.189	0.1970	10.396	24.201	981.0
ZK61-14-67-4	2.58	0.455	0.0615	0.859	0.138	1.336	0.311	0.923	0.1633	1.093	0.1905	7.9404	19.35	854.3
ZK61-14-68-1	0.84	0.186	0.0446	0.308	0.044	0.253	0.0694	0.201	0.0305	0.236	0.0406	8.9619	6.0834	329.7
ZK61-14-68-2	1.81	0.32	0.040	0.27	0.076	0.60	0.168	0.48	0.076	0.628	0.118	4.5852	12.931	525
ZK61-14-68-3	0.79	0.198	0.0408	0.252	0.071	0.687	0.169	0.518	0.0742	0.545	0.0940	7.3243	6.54	261.4
ZK61-14-68-4	0.98	0.242	0.0250	0.398	0.077	0.577	0.1335	0.518	0.0643	0.606	0.1291	4.3669	8.5314	345.6
Z-250-33-1	0.18	0.038	0.0184	0.017	0.0256	0.11	0.041	0.122	0.013	0.177	0.0319	7.979	0.518	73.5
Z-250-33-2	0.48	0.1841	0.013	0.187	0.042	0.314	0.079	0.254	0.0414	0.276	0.0568	8.4144	3.180	111.7
Z-250-33-3	0.22	0.019	0.0148	0.141	0.024	0.166	0.023	0.125	0.022	0.278	0.0188	1.765	2.607	51.0

Z-250-15-1	1.23	0.447	0.0552	0.351	0.123	0.870	0.225	0.666	0.151	1.101	0.1346	135.073	15.494	137.7
Z-250-15-2	0.99	0.156	0.0339	0.311	0.106	0.777	0.214	0.642	0.110	0.911	0.1531	121.415	5.111	58.3
