

Table S1. Compositional data of 62 olivine inclusions in diamonds from Liaoning

No.	Sample	SiO2	TiO2	Al2O3	Cr2O3	TFeO	MnO	MgO	NiO	CaO	Na2O	K2O	Total
1	LN50D01	41.21	0.01	0.01	0.05	7.39	0.11	51.28	0.37	0.02			100.45
2	LN50D02	39.98	0	0.01	0.04	7.33	0.1	51.32	0.35	0.03			99.17
3	LN50D02	40.61	0	0.02	0.04	7.11	0.1	51.17	0.34	0.04			99.42
4	LN50D03	41.08	0	0.01	0.08	6.38	0.09	51.62	0.34	0.02			99.62
5	LN50D03	41.36	0	0.01	0.08	6.52	0.13	51.74	0.35	0.03			100.22
6	LN50D03	41.22	0.01	0.02	0.13	6.35	0.06	51.14	0.39	0.02	0.02		99.37
7	LN50D04	41.38	0.01	0.01	0.07	6.48	0.11	51.27	0.34	0.02	0		99.69
8	LN50D04	42.02	0	0.01	0.09	6.39	0.09	51.72	0.26	0.03	0		100.61
9	LN50D06	41.2	0.01	0	0.07	7.08	0.09	51.35	0.37	0.03			100.2
10	LN50D06	40.69	0	0.01	0.06	7.24	0.12	51.02	0.36	0.03			99.53
11	LN50D06	40.69	0.01	0.02	0.04	7.05	0.12	50.98	0.34	0.04			99.29
12	LN50D11	40.58	0.01	0	0.04	7.49	0.11	50.72	0.39	0.04			99.37
13	LN50D11	41.14	0	0.01	0.02	7.56	0.09	50.18	0.38	0.04	0.02		99.44
14	LN50D12	41.52	0.02	0.05	0.08	7.78	0.11	50.78	0.36	0.02	0.02		100.74
15	LN50D12	40.92	0	0.12	0.07	7.56	0.13	49.89	0.43	0.03	0.01		99.14
16	LN50D14	40.94	0	0.04	0.08	7.7	0.06	50.68	0.42	0.04	0.01		99.97
17	LN50D14	40.48	0.01	0.34	0.05	7.79	0.12	50.41	0.44	0.09	0.01		99.73
18	LN50D20	40.81	0	0.02	0.02	7.73	0.11	50.9	0.4	0.01			100.01
19	LN50D21	40.83	0.01	0.02	0.08	7.05	0.09	51.2	0.35	0.03	0.01		99.67
20	LN50D30	39.71	0.01	0.02	0.04	8.07	0.13	49.15	0.42	0.05	0.02		97.62
21	LN50D35	41.13	0.01	0.01	0.04	6.87	0.09	51.62	0.35	0.02	0.01		100.15
22	LN50D35	41.18	0	0.01	0.07	6.77	0.1	52.1	0.3	0.02	0.01		100.55
23	LN50D39	41.34	0	0.02	0.08	7.33	0.15	50.45	0.38	0.04			99.78
24	LN50D44	41.54	0.01	0	0.1	7.59	0.1	50.86	0.39	0.04			100.63

25	LN50D45	41.11	0	0.01	0.06	6.97	0.12	51.73	0.45	0.03	0.01		100.48
26	LN50D50	40.76	0.01	0.01	0.05	7.61	0.12	50.8	0.41	0.03	0.01		99.82
27	LN50D50	40.95	0	0.02	0.07	7.92	0.05	50.35	0.4	0.04	0.02		99.82
28	LN50D69	40.54	0.01	0.02	0.1	6.82	0.12	50.78	0.34	0.06	0		98.78
29	LN50D69	41.21	0	0.03	0.07	6.65	0.07	50.33	0.36	0.03	0.02		98.76
30	LN50D69	41.06	0	0.02	0.06	6.67	0.06	51.82	0.35	0.05	0.03		100.12
31	LN50D70	41.39	0.01	0.01	0.06	6.53	0.06	50.85	0.31	0.02	0.01		99.24
32	LN50D72	41.83	0	0.05	0.08	7.29	0.14	50.94	0.36	0.03	0.01		100.74
33	LN50D74	40.75	0.02	0.04	0.06	6.75	0.12	51.12	0.29	0.02	0		99.17
34	LN50D79	40.87	0.01	0	0.07	6.94	0.1	50.92	0.35	0.03	0.01		99.3
35	LN50D91	41.7	0.01	0.01	0.03	7.68	0.11	51.39	0.36	0.03	0.01		101.32
36	LN50D91	40.82	0.01	0.01	0.06	7.61	0.09	50.84	0.36	0.02	0		99.81
37	LN50D91	40.76	0	0.01	0.05	7.75	0.06	51.13	0.33	0.02	0.01		100.12
38	LN50D91	40.98	0	0.01	0.03	7.65	0.08	51.27	0.34	0.02	0.01		100.38
39	LN50D94	41.29	0.01	0.01	0.03	6.85	0.11	51.94	0.36	0.04	0		100.64
40	LN50D95	41.27	0	0.01	0.04	6.72	0.1	51.55	0.32	0.02	0		100.05
41	LN50D96	40.19	0.01	0.02	0.03	7.29	0.07	50.73	0.33	0.04	0.01		98.72
42	LN50D99	41.01	0	0	0.04	7.08	0.04	52.02	0.4	0.01	0.01		100.61
43	BDL-001	42.07	0	0	0.07	6.7	0.13	51.49		0.03	0.01	0.01	100.51
44	BDL-004	41.53	0	0	0.08	6.78	0.04	51.97		0.05	0.03	0.01	100.49
45	BDL-005	41.48	0	0.01	0.06	6.83	0.07	51.31		0.02	0	0	99.78
46	DI-inc1	40.82	0	0.03	0.06	6.96	0.1	52.26		0.04	0	0	100.26
47	LN-1	42.17	0	0.04	0.06	6.92	0.09	51.17	0.37	0	0		100.82
48	LN-2	41.28	0	0.04	0.04	7.29	0.09	50.6	0.36	0.02	0		99.72
49	LN-3	41.84	0	0.02	0.05	6.28	0.1	51.36	0.42	0	0		100.07
50	LN-4	42.07	0	0	0.06	6.95	0.1	50.48	0.38	0.01	0		100.05

51	LN-5	41.7	0	0.03	0.04	6.57	0.08	51.19	0.35	0	0		99.96
52	LN-6	41.29	0	0.03	0.05	7.14	0.11	50.26	0.31	0.03	0		99.22
53	LN-7	41.05	0	0.03	0.05	9.4	0.11	48.99	0.39	0.02	0		100.04
54	LN-8	41.25	0	0.01	0.04	7.94	0.11	50.04	0.39	0.01	0		99.79
55	LN-9	40.69	0	0.02	0.05	8.63	0.15	49.35	0.32	0.03	0		99.24
56	LN-10	42.23	0	0.03	0.11	5.84	0.08	51.26	0.34	0.04	0		97.93
57	LN-11	41.55	0	0.03	0.09	6.98	0.13	50.26	0.37	0.01	0		99.42
58	LN-12	41.33	0	0.02	0.07	6.69	0.1	50.5	0.37	0	0		99.08
59	LN-13	41.7	0	0.02	0.05	7.27	0.09	51.3	0.25	0.05	0.04		100.8
60	LN-14	41.3	0.02	0.02	0.05	6.87	0.11	50.5	0.32	0.09	0.03		99.3
61	L22-2ol	41.33	0	0	0.08	6.13	0.12	51.35	0.36	0.03	0	0.01	99.38
62	L32-01-ol	41.6	0	0.01	0.01	8.8	0.13	50	0.36	0	0.01	0	100.9

1-42 from [4], 43-45 from [6], 47-60 from [8], 61 from [44], 62 from [7]

Table S2. Temperature estimation using three thermometers based on EPMA data for 35 sample

	Sample	T [Al-Ol, dH10-Dia] Cr# 0.35-0.75	T [Cr-Ol, dH10] Cr ²⁺	T [Al-Ol, Bw17] Cr > 0.45	Standard Deviation	Average	Cr#
1	LN50D01		1138	1122	8	1130	77.03
2	LN50D02	1123	1124	1122	1	1123	72.85
3	LN50D02	1221	1206	1229	10	1218	57.30
4	LN50D03		1177	1122	28	1149	84.29
5	LN50D03		1177	1122	28	1149	84.29
6	LN50D03		1286	1229	28	1257	81.34
7	LN50D04		1164	1122	21	1143	82.44
8	LN50D04		1189	1122	34	1156	85.79
9	LN50D06		1151	1122	15	1136	80.10
10	LN50D06	1221	1206	1229	10	1218	57.30
11	LN50D11	1123	1099	1122	11	1114	57.30
12	LN50D12	1374	1362	1399	15	1378	51.77
13	LN50D14	1333	1331	1354	10	1339	57.30
14	LN50D20	1221	1183		19	1202	40.15
15	LN50D21	1221	1242	1229	9	1230	72.85
16	LN50D30	1221	1206	1229	10	1218	57.30
17	LN50D35	1123	1124	1122	1	1123	72.85
18	LN50D35		1164	1122	21	1143	82.44
19	LN50D39	1221	1242	1229	9	1230	72.85
20	LN50D45		1151	1122	15	1136	80.10
21	LN50D50		1138	1122	8	1130	77.03
22	LN50D50	1221	1233	1229	5	1228	70.13

23	LN50D69		1260	1229	15	1244	77.03
24	LN50D69	1285	1284	1300	7	1289	61.02
25	LN50D69	1221	1224	1229	3	1225	66.81
26	LN50D70		1151	1122	15	1136	80.10
27	LN50D72	1374	1362	1399	15	1378	51.77
28	LN50D74	1333	1316	1354	16	1334	50.16
29	LN50D91	1123	1111	1122	5	1119	66.81
30	LN50D91		1151	1122	15	1136	80.10
31	LN50D91		1138	1122	8	1130	77.03
32	LN50D91	1123	1111	1122	5	1119	66.81
33	LN50D94	1123	1111	1122	5	1119	66.81
34	LN50D95	1123	1124	1122	1	1123	72.85
35	LN50D96	1221	1196	1229	14	1215	50.16

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