

G&G Data Depository: Trace element compositions of Be-diffused and natural-color corundum determined using SIMS (ppma).^a

Sample	Location	Color	Be ^c	Na ^b	Mg	Si	K ^b	Ti	Cr	Fe	Ga
<i>Be-diffused</i>											
39402	Edge	Orange	14.5	0.04	111	na	0.02	na	383	670	26.3
39402	Midpoint		1.39	0.05	107	na	0.02	na	313	515	17.5
39402	Center	Pink	1.41	0.04	77.3	na	0.01	na	261	466	14.6
39403	Edge	Orange	22.6	0.46	124	na	0.30	na	139	689	40.5
39403	Edge	Orange	24.0	0.33	106	na	0.29	52.5	131	621	32.4
39403	Center	Pink	1.38	0.15	69.1	na	0.10	na	78.2	395	17.0
39403	Center	Pink	1.33	0.02	108	na	0.03	53.6	129.5	627	33.4
39404	Edge	Orange	23.8	3.08	123	na	2.22	na	274	754	40.2
39404	Midpoint		1.36	0.74	82.2	na	0.71	na	186	590	27.9
39404	Center	Pink	1.41	0.52	60.7	na	0.39	na	131	431	16.7
45032	Edge	Orange	15.4	0.52	89.4	na	0.62	na	670	771	36.0
45032	Center	Orange	24.5	1.60	81.2	na	2.48	na	535	607	24.3
45033	Edge	Orangy red	19.2	0.21	78.5	na	0.14	na	707	1083	19.5
45033	Center	Orangy red	16.4	0.28	76.5	na	0.18	na	712	1056	19.0
45035	Edge	Yellow	20.5	3.74	24.1	na	3.18	na	5.67	3213	53.4
45035	Edge	Yellow	20.6	0.06	25.4	na	0.05	43.7	4.13	3488	55.4
45035	Center	Yellow	23.3	0.94	30.9	na	0.87	na	5.19	3003	58.0
45035	Center	Yellow	16.4	0.03	24.7	na	0.04	23.1	9.18	3379	54.9
45082	Edge	Pink	24.3	0.29	181	na	0.12	na	839	278	41.9
45082	Edge	Pink	25.0	0.40	215	na	0.13	153	1062	349	51.7
45082	Center	Pink	1.47	7.80	152	na	3.02	na	712	226	27.5
45082	Center	Pink	1.41	0.84	195	na	0.41	140	1048	336	49.5
45082	Center	Pink	1.39	0.38	192	na	0.21	140	1046	333	48.8
45490	Edge	Yellow	24.5	0.04	5.20	na	0.01	20.0	3.91	1490	33.8
45490	Center	Yellow	3.14	0.03	11.8	na	0.01	15.8	3.93	1509	46.9

45491	Edge	Yellow	21.6	0.17	55.6	na	0.03	8.59	1.46	250	27.5
45491	Center	Pale yellow	1.85	0.12	48.4	na	0.02	6.00	0.22	194	19.3
45492	Edge	Orange	15.8	0.42	127	57.1	0.19	77.8	61.5	315	19.9
45492	Center	Pink	1.54	0.08	126	38.1	0.03	72.4	55.6	294	18.0
48413		Orange	224	5.65	151	na	1.98	219	122	157	28.6
48415		Red	25.1	0.43	64.0	na	0.24	47.4	4118	2441	53.8
48430		Orange	18.1	0.07	70.1	18.3	0.04	29.5	133	749	32.7
48430		Orange	18.0	0.06	47.7	na	0.06	26.8	149	846	35.5
48717		Orange	27.5	0.57	42.7	43.6	0.44	24.1	95.9	483	32.8
48849		Orange yellow	12.2	0.06	61.2	18.5	0.03	41.2	35.2	212	17.5
48851		Yellow	8.13	0.10	119	36.3	0.06	80.3	33.9	534	21.6
48853		Pinkish orange	7.32	0.13	90.5	184	0.28	44.6	221	950	21.6
48878		Red	19.9	0.11	854	161	0.08	529	3317	1756	32.1
48882		Orange	14.6	0.05	96.2	8.61	0.04	79.5	54.2	132	7.99
49415		Red	24.5	0.10	568	229	0.24	204	2098	1195	30.8

Before / after Be diffusion ^d

49053	Before	Colorless	1.38	0.08	38.4	27.6	0.02	7.81	0.21	72.3	19.1
49053	After	Yellow	15.9	0.41	29.6	38.0	0.31	5.03	0.96	88.3	54.3
49074	Before	Light yellow, close to colorless	1.52	0.05	160	57.3	0.03	61.6	0.63	105	15.9
49074	After	Orange	34.7	0.59	221	74.7	0.13	44.9	2.31	74.1	31.1
49076	Before	Colorless	1.70	0.04	183	16.0	0.02	174	0.71	216	6.41
49076	After	Orange	99.2	0.56	375	162	0.43	118	7.45	271	23.2
49081-1	Before	Green	1.46	0.12	80.3	17.8	0.03	63.2	90.1	1461	16.1
49081-1	After	Orange	114	0.15	1083	178	0.08	646	66.9	529	24.2
49081-2	Before	Light yellow	1.46	0.20	76.1	16.1	0.04	63.0	80.7	1358	13.0
49081-2	After	Blue	116	0.16	1245	173	0.14	771	61.1	603	36.7
49086	Before	Green	1.49	0.04	20.5	15.0	0.02	27.3	1.66	2603	22.0
49086	After	Brown	38.3	0.08	22.5	5.88	0.03	19.2	28.8	1594	34.4

49089-1	Before	Light yellow	1.48	3.96	35.8	17.7	0.17	29.1	4.61	2646	39.7
49089-1	After	Intense yellow	17.1	0.32	32.5	34.0	0.23	23.7	2.15	2386	73.1
49089-2	Before	Blue	1.52	0.16	9.20	18.2	0.03	120	2.57	1998	29.6
49089-2	After	Deep blue	103	0.91	20.6	73.3	1.08	179	7.93	1850	59.5
49093	Before	Purple	2.17	0.05	101	16.2	0.02	908	570	459	8.58
49093-1	After	Purple	113	3.97	65.3	36.2	0.39	89.8	823	1443	28.2
49093-2	After	Blue	27.4	1.82	98.0	24.5	1.33	349	849	510	29.4
49094	Before	Light pink	1.67	0.05	200	38.1	0.04	155	79.8	115	31.4
49094	After	Light pinkish orange	40.3	0.14	233	29.1	0.08	127	77.2	102	42.0
49102	Before	Pink	1.42	0.10	28.5	40.3	0.07	742	1061	8.91	18.4
49102	After	Pink	52.1	2.43	32.7	31.8	1.22	490	1042	13.3	28.5
49102	After	Pink	39.3	0.96	26.7	27.1	0.59	451	921	10.9	26.1
49103	Before	Yellowish brown	1.45	0.02	53.4	18.9	0.03	42.0	378	2375	17.9
49103	After	Orange	29.3	0.05	46.6	7.91	0.03	104	272	1306	30.2
49104	Before	Orange-brown	1.43	0.07	35.0	58.6	0.07	20.9	401	1855	19.1
49104	After	Orange	xx	xx	xx	xx	xx	xx	xx	xx	xx
49105	Before	Gray-green	1.42	0.20	52.0	21.8	0.07	27.2	194	2424	17.7
49105	After	Orange	xx	xx	xx	xx	xx	xx	xx	xx	xx
49106	Before	Yellowish brown	1.24	0.07	56.8	22.1	0.04	40.1	237	2496	20.7
49106	After	Orange	17.4	0.54	43.9	15.4	0.41	28.6	222	1610	28.8
49109	Before	Brown-purple	1.46	0.04	38.7	14.8	0.03	32.2	225	2022	13.3
49109	After	Orange	35.9	0.06	66.1	9.43	0.04	65.8	128	1440	45.0
49110	Before	Gray-violet	1.41	0.02	40.7	15.1	0.02	33.4	237	1945	14.3
49110	After	Orange	269	0.06	206	198	0.04	296	266	666	25.8
49111	Before	Grayish violet	1.46	0.15	103	26.6	0.07	71.9	265	2239	16.8
49111	After	Orange	35.2	0.48	70.6	16.2	0.41	42.0	236	1627	27.6

49112	Before	Orange brown	1.48	0.10	26.4	16.1	0.04	22.2	755	2436	16.4
49112	After	Orangy red	xx	xx	xx	xx	xx	xx	xx	xx	xx
49113	Before	Brown	1.50	0.06	61.23	18.0	0.04	49.4	2525	2053	26.8
49113	After	Red	42.4	0.30	53.88	17.8	0.11	33.7	2054	1706	41.9
49114	Before	Yellow	1.42	0.04	36.7	46.4	0.07	20.8	0.50	2570	52.1
49114	After	Orangy yellow	34.7	0.18	38.6	7.50	0.09	12.1	1.92	1860	59.0
49314	Before	Blue	3.55	0.04	15.9	13.5	0.02	196	0.13	1800	57.0
49314	After	Deep blue	32.4	0.11	12.6	5.97	0.06	22.6	1.72	1186	69.3
49315	Before	Light blue	1.56	0.03	5.78	12.3	0.02	373	0.08	1722	50.1
49315	After	Deep blue	81.2	0.04	4.13	6.99	0.02	91.9	4.25	964	68.2
45031	Before	Pink	1.20	0.04	105	na	0.02	na	292	153	22.7
45002	After	Pinkish orange	13.2	0.13	109	na	0.09	na	322	145	25.4
45002	After	Pinkish orange	10.8	0.94	145	na	0.86	na	558	228	48.1
45494	Before	Pink	1.44	0.62	167	na	0.12	121	928	158	51.1
45493	After	Pinkish orange	18.0	2.20	134	na	0.67	89.9	781	115	33.6

Non-diffused

45034	Edge	Blue	2.04	0.30	228	na	0.20	na	44.9	149	24.5
45034	Center	Blue	1.77	0.32	199	na	0.27	na	92.6	138	26.0
48414		Pink	1.49	2.46	137	na	1.03	73.6	322	151	44.2
48718		Red	1.15	2.04	45.2	38.4	0.63	334	4300	6.55	62.9
48879		Blue	0.85	2.19	53.5	44.8	1.23	118	0.78	1465	44.7
48880		Blue	0.78	0.94	25.0	49.9	0.61	47.7	1.71	2202	53.4
48881		Blue	0.75	7.12	18.8	51.3	4.49	44.5	0.99	2380	55.9
49183		Blue	1.87	0.21	154	37.4	0.08	237	0.50	162	33.0
49184		Blue	1.51	0.90	37.1	23.8	0.48	134	181	943	51.6
49420		Blue	1.75	0.19	249	26.2	0.07	263	55.2	318	43.3
49421		Light green	1.44	0.03	98.3	20.3	0.02	73.7	4.06	1167	17.7
55016		Blue	1.60	0.04	188	16.2	0.03	120	20.5	328	27.8
55766		Red	1.16	0.05	159	37.3	0.07	67.4	1064	2075	23.6

55766	Red	1.00	0.11	78.3	21.5	0.07	33.8	996	1892	22.6
-------	-----	------	------	------	------	------	------	-----	------	------

^a Notes: na =not analyzed. The uncertainty of Be and Fe is 10-20%; and for Ga, Mg, Si, Ti, Cr, Na, and K, the uncertainty is approximately 30%.

^b High concentrations of Na and K in some analyses could be due to surface contamination

^c High concentrations of Be in some analyses could be due to synthetic corundum overgrowth or remanant of flux

^d before/after analysis was not performed at the exactly same locality for some samples