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Title of article Retrogressive dissolution of garnet: Effect on garnet-biotite geothermometry

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see Geology v. 16, p. 875 - 877 (Oct. 88)

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Table 1 (2 pgs.)

Table 1. MICROPROBE ANALYSES FOR INDIVIDUAL
GARNET-BIOTITE PAIRS

Pair:	1	2	3	4	5	6	7	8	9	10
Calculated * temp. (°C):	443	505	485	460	513	521	541	536	548	556
Garnet rims										
SiO ₂	36.42	36.68	36.56	37.21	36.66	36.76	36.99	36.59	36.72	36.71
TiO ₂	-	0.02	-	0.04	-	0.05	0.01	0.02	-	0.04
Al ₂ O ₃	20.76	20.88	20.88	21.00	20.92	20.79	20.80	20.91	20.80	20.81
FeO _T	34.83	35.99	36.52	35.24	34.80	35.08	35.65	35.12	34.44	33.80
MnO	5.51	3.72	3.95	3.63	4.52	3.98	3.53	3.31	3.77	3.69
MgO	1.52	1.95	1.85	1.51	1.82	1.89	2.04	2.03	1.99	1.93
CaO	0.83	1.15	0.96	1.85	1.41	1.44	1.54	1.59	2.26	3.13
S	99.93	100.39	100.72	100.48	100.13	99.99	100.56	99.56	99.99	100.11
Cations for 24 oxygens										
Si	5.972	5.959	5.938	6.017	5.966	5.985	5.983	5.971	5.967	5.955
Al	4.005	3.999	3.997	4.002	4.012	3.988	3.965	4.021	3.985	3.978
Fe	4.766	4.883	4.959	4.765	4.735	4.774	4.819	4.793	4.678	4.582
Mg	0.371	0.472	0.449	0.365	0.442	0.459	0.493	0.493	0.482	0.468
Ti	-	0.003	-	0.005	0.001	0.007	0.002	0.003	0.001	0.006
Mn	0.763	0.512	0.543	0.498	0.623	0.549	0.484	0.458	0.519	0.507
Ca	0.146	0.200	0.168	0.321	0.247	0.251	0.268	0.278	0.394	0.544
S	16.023	16.028	16.054	15.973	16.026	16.013	16.014	16.017	16.026	16.040
Fe/Fe+Mg	0.928	0.919	0.917	0.929	0.915	0.912	0.907	0.907	0.907	0.907
Xal	0.788	0.805	0.810	0.801	0.783	0.792	0.794	0.796	0.770	0.751
Xpy	0.062	0.078	0.074	0.062	0.073	0.076	0.082	0.082	0.080	0.077
Xgr	0.024	0.033	0.027	0.053	0.041	0.041	0.044	0.046	0.064	0.088
Xsp	0.126	0.084	0.089	0.084	0.103	0.091	0.080	0.076	0.086	0.084
Biotite										
SiO ₂	34.92	35.09	35.20	35.21	34.79	34.67	35.01	34.74	34.39	34.70
TiO ₂	1.07	1.10	1.10	1.69	1.17	1.08	1.43	1.28	1.38	1.34
Al ₂ O ₃	17.64	17.83	18.19	18.37	18.22	18.03	17.84	18.38	18.09	18.39
FeO _T	21.94	22.39	22.31	22.02	22.26	21.93	22.13	22.27	22.57	22.31
MnO	0.13	0.18	0.20	0.14	0.16	0.18	0.12	0.20	0.15	0.13
MgO	8.87	8.83	8.81	8.45	8.34	8.37	8.28	8.55	8.54	8.40
CaO	0.01	0.02	0.07	0.05	0.01	0.01	-	0.02	0.01	-
Na ₂ O	0.04	0.05	-	0.07	0.10	0.07	0.04	0.10	0.11	0.03
K ₂ O	9.42	9.16	8.95	9.42	9.11	9.76	8.78	9.25	9.20	9.22
S	94.04	94.65	94.83	95.42	94.16	94.10	93.63	94.78	94.45	94.53
Cations for 22 oxygens										
Si	5.489	5.487	5.479	5.428	5.467	5.468	5.521	5.431	5.413	5.438
Al	3.276	3.285	3.338	3.338	3.375	3.351	3.317	3.386	3.356	3.397
Fe	2.892	2.929	2.903	2.840	2.925	2.892	2.918	2.911	2.971	2.924
Mg	2.083	2.058	2.045	1.942	1.953	1.967	1.946	1.992	2.003	1.962
Ti	0.158	0.161	0.160	0.196	0.173	0.160	0.212	0.188	0.204	0.198
Mn	0.018	0.024	0.026	0.018	0.022	0.024	0.016	0.026	0.020	0.018
K	1.894	1.827	1.777	1.853	1.826	1.964	1.767	1.844	1.847	1.842
Na	0.012	0.016	-	0.022	0.032	0.022	0.011	0.031	0.032	0.009
Ca	0.002	0.004	0.012	0.008	0.002	0.001	-	0.003	0.002	-
S	15.824	15.791	15.740	15.645	15.775	15.849	15.708	15.812	15.848	15.788
Fe/Fe+Mg	0.581	0.587	0.587	0.594	0.600	0.595	0.600	0.594	0.597	0.598

*By using calibration of Newton and Haselton (1981)

Table 1. (continued)

Pair: Calculated * temp. ($^{\circ}$ C):	11	12	13	14	15	16	17	18	19	20	21
Garnet rims											
SiO ₂	37.11	36.58	36.76	36.78	36.80	37.37	36.82	36.60	37.01	36.85	36.63
TiO ₂	0.03	0.01	-	-	0.01	-	0.01	-	-	0.02	0.03
Al ₂ O ₃	20.85	21.03	20.75	20.92	20.93	21.00	20.70	21.07	20.78	20.79	20.66
FeO _T	34.32	33.97	32.99	35.26	36.00	36.24	34.70	35.99	33.84	36.23	36.10
MnO	3.61	3.92	3.93	3.67	3.39	2.83	3.69	3.51	3.65	3.69	3.30
MgO	1.94	1.96	1.93	2.15	2.14	2.24	2.17	2.30	2.00	2.04	2.05
CaO	3.15	3.83	3.29	1.59	1.42	1.56	2.54	1.48	3.40	0.99	1.05
S	101.01	101.30	99.65	100.35	100.70	101.24	100.64	100.95	100.68	100.61	99.84
Cations for 24 oxygens											
Si	5.966	5.884	5.977	5.961	5.952	5.995	5.949	5.913	5.964	5.972	5.978
Al	3.952	3.987	3.976	3.996	3.991	3.970	3.941	4.012	3.946	3.970	3.974
Fe	4.609	4.564	4.482	4.777	4.868	4.862	4.682	4.860	4.554	4.906	4.923
Mg	0.464	0.471	0.467	0.519	0.517	0.536	0.524	0.554	0.480	0.494	0.500
Ti	0.005	0.002	-	0.001	0.001	-	0.002	-	-	0.002	0.005
Mn	0.491	0.534	0.542	0.504	0.464	0.384	0.505	0.480	0.498	0.507	0.456
Ca	0.543	0.659	0.574	0.276	0.247	0.268	0.440	0.256	0.587	0.171	0.185
S	16.030	16.101	16.018	16.034	16.040	16.015	16.043	16.075	16.029	16.022	16.021
Fe/Fe+Mg	0.909	0.906	0.906	0.902	0.904	0.901	0.899	0.898	0.905	0.909	0.908
Xal	0.753	0.731	0.738	0.786	0.798	0.804	0.759	0.790	0.742	0.806	0.812
Xpy	0.077	0.077	0.077	0.086	0.085	0.088	0.086	0.090	0.079	0.082	0.083
Xgr	0.089	0.106	0.095	0.045	0.041	0.044	0.072	0.042	0.097	0.028	0.029
Xsp	0.081	0.086	0.090	0.083	0.076	0.064	0.083	0.078	0.082	0.084	0.076
Biotite											
SiO ₂	34.65	34.64	35.21	35.14	35.13	34.99	35.03	34.82	34.84	35.04	34.66
TiO ₂	0.85	0.77	0.93	0.99	0.95	1.38	0.95	1.04	1.07	1.17	1.10
Al ₂ O ₃	17.96	17.71	18.23	18.03	18.43	18.52	18.11	18.52	17.79	18.04	17.97
FeO _T	22.61	22.62	21.33	22.20	21.73	22.28	22.00	21.95	22.27	21.66	21.87
MnO	0.24	0.21	0.18	0.04	0.15	0.19	0.20	0.17	0.18	0.15	0.16
MgO	8.85	9.26	8.94	8.77	8.64	7.56	8.56	8.61	8.47	8.66	8.90
CaO	-	0.02	0.03	0.04	-	0.02	0.02	-	0.02	-	-
Na ₂ O	0.02	0.02	0.04	0.08	0.03	0.04	-	0.05	0.02	0.03	-
K ₂ O	8.84	9.10	9.16	8.55	9.13	9.80	9.28	8.99	9.68	9.14	9.35
S	94.03	94.35	94.05	93.85	94.20	94.79	94.15	94.14	94.33	93.90	94.01
Cations for 22 oxygens											
Si	5.445	5.441	5.495	5.508	5.490	5.452	5.512	5.453	5.484	5.503	5.459
Al	3.334	3.278	3.362	3.331	3.394	3.401	3.358	3.418	3.300	3.339	3.339
Fe	2.979	2.972	2.793	2.911	2.841	2.903	2.892	2.875	2.932	2.845	2.881
Mg	2.078	2.168	2.085	2.049	2.013	1.756	2.006	2.010	1.987	2.026	2.090
Ti	0.126	0.113	0.137	0.146	0.140	0.162	0.140	0.153	0.159	0.173	0.163
Mn	0.032	0.027	0.024	0.058	0.020	0.025	0.027	0.022	0.024	0.020	0.023
K	1.776	1.823	1.830	1.710	1.821	1.948	1.863	1.795	1.944	1.832	1.882
Na	0.007	0.007	0.013	0.025	0.009	0.013	-	0.016	0.007	0.010	-
Ca	-	0.004	0.005	0.006	-	0.003	0.004	-	0.003	-	-
S	15.777	15.833	15.744	15.744	15.728	15.663	15.776	15.742	15.840	15.748	15.836
Fe/Fe+Mg	0.589	0.578	0.573	0.587	0.585	0.623	0.598	0.589	0.596	0.584	0.580

*By using calibration of Newton and Haselton (1981)