Table DR1. Calculation of depression of melting temperature (deg C) over a range of pressures due to OH fluxing

ppm water	F=0		F=.001		F=0.01		0.2 GPa			0.5 GPa			1.0 GPa			1.25 GPa			1.5 GPa		
granite	Wt% OH	X(OH)	Wt% OH	X(OH)	Wt% OH	X(OH)	F=0	F=0.001	F=0.01	F=0	F=0.001	F=0.01	F=0	F=0.001	F=0.01	F=0	F=0.001	F=0.01	F=0	F=0.001	F=0.01
0	0	0	0	0	0	0	980	980	980	1010	1010	1010	1060	1060	1060	1085	1085	1085	1110	1110	1110
100	2.50	0.090	2.00	0.073	0.72	0.027	969	971	977	998	1000	1006	1047	1050	1056	1072	1074	1081	1096	1099	1106
200	5.00	0.169	4.00	0.139	1.43	0.053	958	962	973	987	991	1003	1035	1040	1052	1059	1064	1077	1083	1088	1102
300	7.50	0.239	6.00	0.198	2.15	0.078	948	954	970	977	983	1000	1024	1031	1049	1048	1055	1073	1071	1078	1098
400	10.00	0.301	8.01	0.252	2.87	0.102	938	946	967	967	974	996	1013	1022	1045	1036	1045	1070	1060	1069	1094
500	12.50	0.356	10.01	0.301	3.58	0.126	929	938	964	957	966	993	1003	1013	1042	1026	1036	1066	1049	1060	1091
600	15.00	0.406	12.01	0.345	4.30	0.148	921	931	961	948	959	990	993	1005	1039	1015	1028	1063	1038	1051	1087
700	17.50	0.451	14.01	0.387	5.01	0.170	912	924	958	939	951	987	983	997	1035	1006	1019	1059	1028	1042	1083
800	20.00	0.492	16.01	0.424	5.73	0.190	904	917	955	930	944	984	974	989	1032	996	1011	1056	1018	1034	1080
900	22.50	0.529	18.01	0.459	6.45	0.210	896	910	952	922	937	981	965	981	1029	987	1004	1052	1008	1026	1076
1000	25.00	0.563	20.02	0.492	7.16	0.230	888	904	949	914	930	978	956	974	1025	978	996	1049	999	1018	1073
1100	27.50	0.595	22.02	0.522	7.88	0.249	880	897	947	906	923	975	948	967	1022	969	988	1046	990	1010	1069
1200	30.00	0.624	24.02	0.550	8.60	0.267	873	891	944	898	917	972	939	960	1019	960	981	1043	981	1002	1066
1300	32.50	0.651	26.02	0.576	9.31	0.284	865	885	941	890	910	969	931	953	1016	952	974	1039	972	995	1063
1400	35.00	0.676	28.02	0.601	10.03	0.301	858	879	938	883	904	966	923	946	1013	943	967	1036	963	988	1060
1500	37.50	0.699	30.02	0.624	10.74	0.318	851	873	936	875	898	964	915	939	1010	935	960	1033	955	981	1056
1600	40.00	0.721	32.03	0.646	11.46	0.334	844	867	933	868	892	961	907	933	1007	927	953	1030	946	974	1053
1700	42.50	0.741	34.03	0.666	12.18	0.349	837	861	930	860	886	958	899	926	1004	918	946	1027	938	967	1050
1800	45.00	0.760	36.03	0.685	12.89	0.364	830	855	928	853	880	955	891	920	1001	910	940	1024	929	960	1047
1900	47.50	0.778	38.03	0.704	13.61	0.379	822	849	925	845	874	953	883	913	998	902	933	1021	921	953	1044
2000	50.00	0.795	40.03	0.721	14.33	0.393	815	844	923	838	868	950	875	907	996	894	926	1018	912	946	1041
2100	52.50	0.810	42.03	0.737	15.04	0.406	808	838	920	830	862	948	867	901	993	885	920	1015	904	939	1038
2200	55.00	0.825	44.04	0.753	15.76	0.420	801	832	918	823	856	945	859	894	990	877	913	1012	895	932	1035
2300	57.50	0.840	46.04	0.767	16.48	0.433	793	827	915	815	850	942	851	888	987	869	907	1010	886	926	1032
2400	60.00	0.853	48.04	0.781	17.19	0.445	786	821	913	807	844	940	843	881	985	860	900	1007	877	919	1029
2500	62.50	0.866	50.04	0.795	17.91	0.458	778	815	911	799	838	937	834	875	982	851	894	1004	868	912	1026
2600	65.00	0.878	52.04	0.808	18.62	0.469	770	809	908	791	832	935	825	869	979	842	887	1001	859	905	1023
2700	67.50	0.889	54.04	0.820	19.34	0.481	762	804	906	783	826	932	816	862	977	833	880	998	849	898	1020
2800	70.00	0.900	56.04	0.831	20.06	0.492	754	798	904	774	820	930	807	856	974	823	874	996	839	891	1018
2900	72.50	0.911	58.05	0.843	20.77	0.503	745	792	901	765	813	928	797	849	971	813	867	993	829	884	1015
3000	75.00	0.921	60.05	0.853	21.49	0.514	736	786	899	755	807	925	787	842	969	803	860	990	818	877	1012
ΔT-3000							244	194	81	255	203	85	273	217	91	282	225	94	292	233	98

Wt% OH calculated using D=0.004; ΔH-fusion = 420 kJ/kg; F = fraction of partial melt; ΔT-3000: melting point depression for 3000 ppm OH in starting granite.

Table DR2. Analysis of Westerly Granite, Westerly, Rhode Island (Whitney, 1988)

SiO2	72.34
TiO2	0.26
Al2O3	14.34
Fe2O3	0.68
FeO	1.13
MnO	0.02
MgO	0.37
CaO	1.52
Na2O	3.37
K2O	5.97
P2O5	0.11
total	100.11

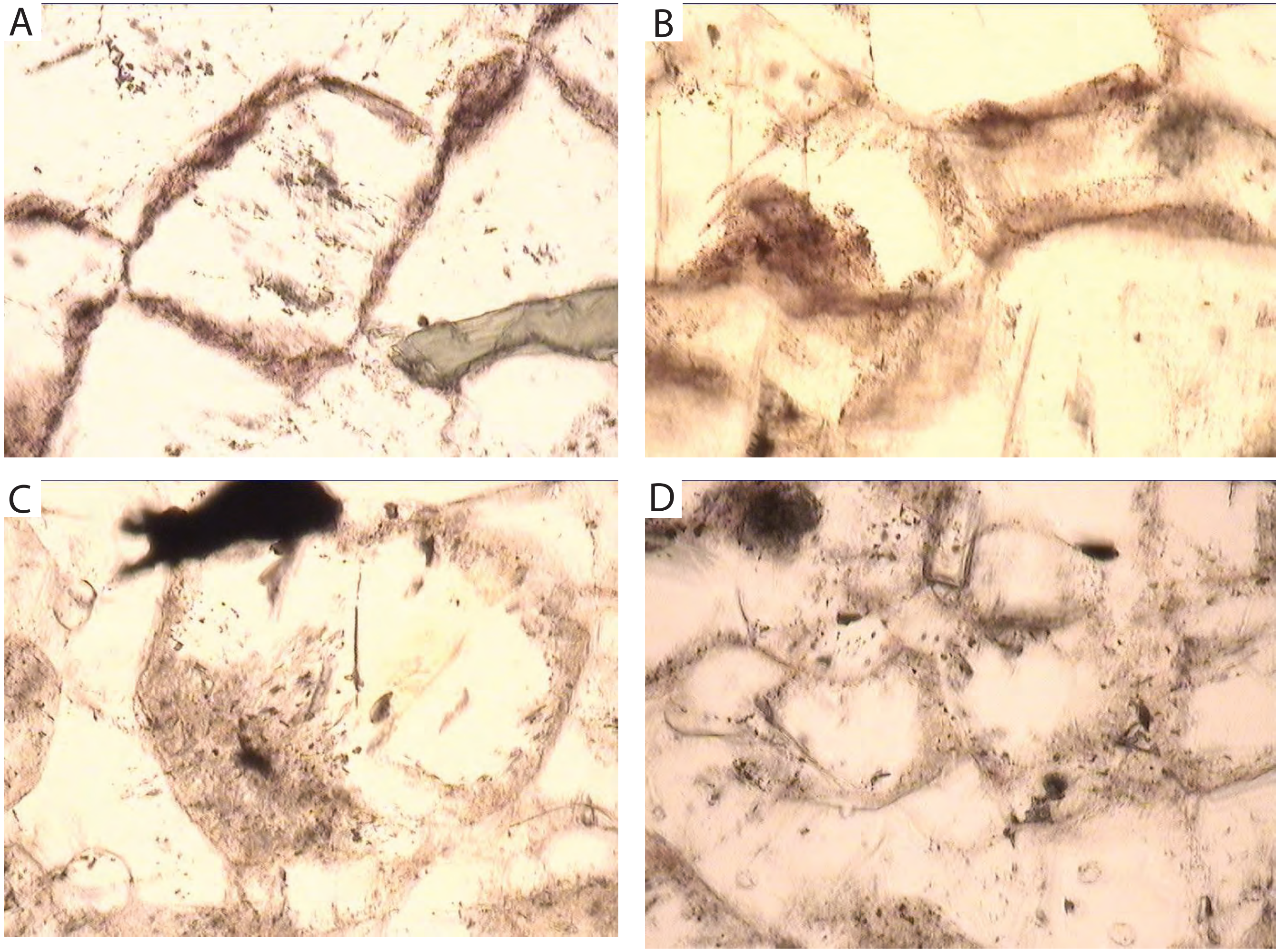

Figure DR1: A) Photomicrograph of quartz crystals and alkali feldspar crystals in moderately deformed Stevenson Granite bounded by brown multi-phase material interpreted as former melt films. Brown material consists of quartz, alkali feldspar, plagioclase, and iron oxides. B) Photomicrograph of quartz and feldspar crystals in moderately deformed Stevenson Granite bounded by brown multi-phase material interpreted as former melt films. Appearance of heavier melt film material on some grain boundaries may result from some grain boundary surfaces being nearly parallel to the surface of the thin section. C) Photomicrograph of an alkali feldspar crystal (center) surrounded by brown multi-phase material interpreted as former partial melt. D) Photomicrograph of quartz and alkali feldspar crystals bordered by films of brown material interpreted as former partial melt. Note accumulation of material into small pools at triple junctions of grains.

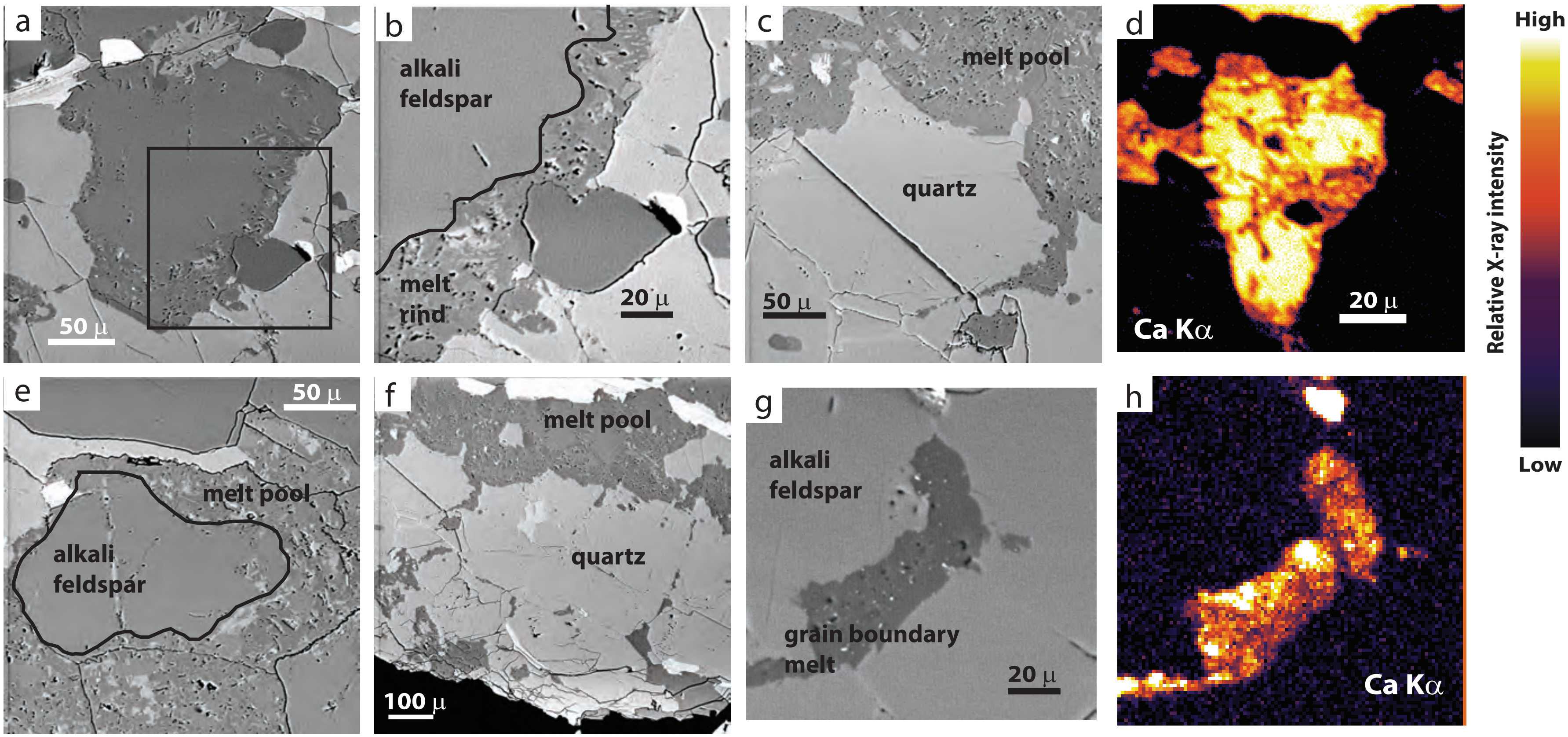

Figure DR2. A) Backscattered electron image of an alkali feldspar crystal in the Stevenson Granite surrounded by the brown material interpreted as former partial melt (shown in Supplementary Document 1). Note the distinctively pitted surface of the possible partial melt film material. B) Higher magnification view of a portion of the backscattered electron image shown in A. Note the zones of varying brightness in the material interpreted as former partial melt bordering the alkali feldspar crystal. These variably bright zones are different mineral phases (quartz, alkali feldspar, plagioclase, and iron oxide), consistent with fine-grained crystals formed in a melt. No micas have been identified in the possible partial melt zones. Note also the crenulate margin with the alkali feldspar crystal. C) Backscattered electron image of a quartz crystal adjacent to an accumulation of material interpreted as former partial melt. D) X-ray concentration map of abundance of Ca in a pool of material interpreted as former partial melt in the Stevenson Granite. Bright areas are plagioclase. Yellow areas are alkali feldspar. Orange areas are quartz. Black areas are iron oxides. Image was collected on a Cameca SX-50 electron microprobe in the Department of Geosciences at the University of Massachusetts. E) Backscattered electron image of an alkali feldspar crystal surrounded by a relatively large accumulation of material interpreted as former partial melt, in a relatively highly strained sample of the Stevenson Granite. F) Backscattered electron image of a quartz crystal surrounded by an accumulation of material interpreted as former partial melt, in a relatively highly strained sample of the Stevenson Granite. G) Backscattered electron image of material interpreted as former partial melt between alkali feldspar crystals in the Stevenson Granite. H) X-ray concentration map of abundance of Ca in the pool of material interpreted as former partial melt in the Stevenson Granite shown in G. Bright areas are plagioclase. Yellow areas are alkali feldspar. Orange areas are quartz. Black areas are iron oxides. Image was collected on a Cameca SX-50 electron microprobe in the Department of Geosciences at the University of Massachusetts.