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Dissolution rates of plagioclase at pH = 2 and 3

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For deposit: Appendix 1-9

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## APPENDIX 2

This appendix includes the raw and partly reduced data which were modeled to calculate the specific reaction rates compiled in Table 3. The appendix is broken up into four sections. The experimental run conditions are compiled in the first section. The second section includes the raw concentrations as a function of time, and the third section includes the concentrations after they are corrected for solution volume, mineral composition and area, and any dilutions due to sampling. Short sample descriptions are reported in the fourth section. Note that two sets of dissolution experiments were performed, and not all data were used in the rate calculation. In all subsequent sections, the numbers correspond to following feldspars:

- |                                 |                                 |
|---------------------------------|---------------------------------|
| 1-Keystone Albite               | 2-Mitchell County Oligoclase #1 |
| 3-Mitchell County Oligoclase #2 | 4-Bancroft Albite               |
| 5-Saranac Lake Andesine #1      | 6-Saranac Lake Andesine #2      |
| 7-Pueblo Park Bytownite         | 8-Crystal Bay Bytownite         |
| 9-Grass Valley Anorthite        |                                 |

## SECTION 1:

Experimental run conditions. Mass and volume correspond to the total mineral mass (g) and total solution volume (ml) employed in the dissolution experiments.

	2	3	8	9	4	7	1	5	6
Mass	0.1152	0.1503	0.0572	0.0656	0.4222	0.1299	0.4175	0.1526	0.1049
Volume	250	250	1000	1000	250	250	250	250	250
				Experimental Set #1:					
Mass	0.0404	0.1422	0.1981	0.0489	0.0739	0.1244	0.0542	0.0764	0.0642
Volume	250	250	1000	1000	250	250	250	250	250
				Experimental Set #2:					

SECTION 2:

Raw concentrations of silicon, aluminum, sodium and calcium as a function of time. in the experiments. The concentrations are not corrected for the solution volume, the average composition of the feldspar, any dilutions due to sampling, and the mineral surface area in the experiment. Gaps in the data indicate that either no sample was taken or that the sample was lost. Data for replicate experiments are reported. Only silicon and aluminum concentrations were measured in the second set of data.

Set #1	time (s)	2	3	8	9	4	7	1	5	6	
		(Si-micrograms/l)									
0.00E+00	0	0	0	0	0	0	0	0	0	0	
1.08E+04	27	24	0	396	416	122	56	67	80	114	
3.24E+04	41	42	509	1041	161	92	105	106	106	168	
7.74E+05	81	61	746	2330	219	162	139	191	191	263	
1.22E+05	90	78	943	3333	260	212	163	242	242	329	
1.62E+05	96	87	1085	4139	290	257	186	287	287	383	
2.07E+05	113	105	1257	4940	330	305	210	341	341	441	
2.49E+05	130	112	1346	5457	363	337	229	380	380	501	
2.92E+05	142	123	1449	5856	391	382	245	415	415	554	
3.33E+05	145	132	1539	6364	412	403	265	453	453	592	
3.81E+05	163	149	1677	6788	441	438	276	490	490	633	
4.20E+05	168	155	1764	7086	471	470	297	525	525	681	
4.72E+05	177	174	1847	7681	500	520	323	559	559	725	
5.11E+05	197	191	1913	7785	522	545	334	584	584	744	
5.51E+05			1955	7940	534	565	348	601	601	767	
5.98E+05	213	208	2012	8004	567	590	362	629	629	826	
6.40E+05					590	590	388	671	671	851	
7.27E+05	256	247			657	657	419	728	728	901	
9.01E+05	298	297			765	765	499	841	841	1037	
9.84E+05					808	808	525	876	876	1094	
1.17E+06					954	954	620	1014	1014	1243	
1.33E+06					1035	1035	681	1123	1123	1342	
1.52E+06					1163	1163	791	1228	1228	1484	
1.69E+06					1267	1267	848	1314	1314	1590	
1.87E+06					1390	1390	908	1464	1464	1677	

Set #1 time (s)	2	3	(Al-micrograms/l)			4	7	1	5	6
			8	9						
0.00E+00	0	0	0	0	0	0	0	0	0	
1.08E+04	41	67	304	305	281	142	162	129	196	
3.24E+04	48	80	436	935	332	238	173	191	290	
7.74E+04	78	94	811	2145	389	388	188	282	429	
1.22E+05	95	103	939	2994	399	533	196	357	541	
1.62E+05	109	109	1074	3660	438	640	204	429	623	
2.07E+05	115	125	1146	4330	460	745	208	500	715	
2.49E+05	124	122	1563	4767	473	829	210	587	788	
2.92E+05	130	122	1651	4927	391	924	213	616	864	
3.33E+05	140	133	1769	5340	506	949	213	664	925	
3.81E+05	145	141	1888	5688	530	1078	210	729	1000	
4.20E+05	147	147	1986	5665	532	1136	217	762	1039	
4.72E+05	154	154	2101	6375	554	1246	217	815	1081	
5.11E+05	160	160	2176	6566	563	1296	222	855	1109	
5.51E+05			2424	6631	567	1285	223	865	1149	
5.98E+05	174	175	2505	6589	582	1386	220	905	1193	
6.40E+05			2518	6750	593	1408	223	936	1213	
7.27E+05	200	202			633	1722	234	1017	1326	
9.01E+05	223	228			713	2164	258	1163	1475	
9.84E+05					795		267	1303	1547	
1.17E+06					839		299	1424	1735	
1.33E+06					894		309	1547	1875	
1.52E+06					977		332	1674	2097	
1.69E+06					1041		356	1791	2252	
1.87E+06					1107		378	1869	2337	

Set #1	time (s)	2	3	(Ca-micrograms/l)	8	9	4	7	1	5	6
0.00E+00		0	0	0	0	0	0	0	0	0	0
1.08E+04		253	189	183	278	1350	213	1770	0	831	540
3.24E+04		297	126	279	806	1270	165	1750	771	517	517
7.74E+04		208	75	456	1470	1230	258	1730	707	552	552
1.22E+05		201	180	602	2080	1100	387	1580	725	575	575
1.62E+05		190	106	723	2570	1190	390	1510	746	724	724
2.07E+05		211	167	821	3070	1140	541	1760	817	654	654
2.49E+05		179	169	906	3510	1070	521	1620	843	644	644
2.92E+05		182	136	1000	3700	1030	592	1530	836	756	756
3.33E+05		176	157	1080	3830	1020	589	1370	815	785	785
3.81E+05		149	67	1140	4160	981	668	1280	849	812	812
4.20E+05		155	155	1230	4240	935	674	1170	775	881	881
4.72E+05		156	130	1300	4470	907	750	1290	838	863	863
5.11E+05		156	130	1310	4510	875	761	1160	823	857	857
5.51E+05		89	75	1360	4740	850	796	1260	813	835	835
5.98E+05				1430	5090	779	774	1130	842	888	888
6.40E+05				1470	4950	834	984	996	899	915	915
7.27E+05		220	231			909	950	1090	990	984	984
9.01E+05		211	212			878	1140	1290	1030	1130	1130
9.84E+05						913		1010	1110	1120	1120
1.17E+06						872		1060	1210	1180	1180
1.33E+06						918		985	1230	1300	1300
1.52E+06						882		836	1260	1300	1300
1.69E+06						915		863	1290	1460	1460
1.87E+06						871		876	1300	1450	1450

Set #1	time (s)	2	3	8	9	4	7	1	5	6
0.00E+00		0	0	0	0	0	0	0	0	0
1.08E+04		437	490	365	236	619	557	640	469	529
3.24E+04		559	494	344	252	666	525	653	532	744
7.74E+04		468	507	351	318	673	517	805	578	575
1.22E+05		422	575	400	332	646	503	741	579	666
1.62E+05		491	538	428	361	719	580	726	525	643
2.07E+05		485	592	447	361	704	602	698	605	708
2.49E+05		536	560	475	360	721	603	731	669	631
2.92E+05		536	498	464	379	752	679	696	888	826
3.33E+05		531	546	499	396	679	671	752	612	737
3.81E+05		544	501	483	392	690	720	722	692	841
4.20E+05		574	564	513	385	776	700	753	790	870
4.72E+05		474	604	534	466	714	726	656	633	766
5.11E+05		453	510	533	457	803	730	682	707	778
5.51E+05				562	419	739	766	736	620	660
5.98E+05		480	580	542	443	821	723	699	638	723
6.40E+05				560	449	795	734	705	740	750
7.27E+05		503	594			867	766	710	758	784
9.01E+05		579	578			947	835	929	699	821
9.84E+05						1211		818	756	907
1.17E+06						939		867	800	947
1.33E+06						1059		737	908	1176
1.52E+06						1038		864	867	1026
1.69E+06						1308		797	917	1019
1.87E+06						1016		843	927	1016

Set #2: time (s)	2	3	8 (Si-micrograms/l)	9	4	7	1	5	6
4.59E+04	20	40	5640	4080	43	111	13	74	137
8.73E+04	33	54	6670	6410	50	173	25	105	181
1.31E+05	25	54	7070	7870	54	213	14	114	207
1.74E+05	52	81	8370	10000	71	273	35	155	256
2.17E+05	42	88	9330	11100	88	318	38	183	292
2.65E+05	45	102	9690	12400	91	356	42	202	329
3.05E+05	52	105	10300	13600	84	383	42	212	343
3.48E+05									
3.92E+05									

Set #2: time (s)	2	3	8 (Al-micrograms/l)	9	4	7	1	5	6
4.59E+04	27	76	5360	3420	84	283	23	125	120
8.73E+04	33	86	7120	5920	85	448	24	172	148
1.31E+05	37	91	7830	7210	88	582	25	207	177
1.74E+05	48	108	8940	8720	98	702	26	262	189
2.17E+05	49	117	9770	9750	102	769	26	282	201
2.65E+05	52	122	10900	11300	113	864	25	320	205
3.05E+05	53	118	11700	12000	100	921	25	337	207
3.48E+05	56	120	12500	13100	107	991	26	355	217
3.92E+05	58	122	12800	13100	109	969	26	372	201

SECTION 3:

Concentrations of silicon, aluminum, sodium and calcium as a function of time. in the experiments. The concentrations are corrected for the solution volume, the average composition of the feldspar, any dilutions due to sampling, and the mineral surface area i experiment. The units are therefore feldspar-moles/cm . The trend of these values when p against time gives the dissolution rate in units of feldspar-moles/cm<sup>2</sup>/s. Not all of the included in this section are necessarily regressed in calculating the dissolution rates.

time (s)	2	3	8	9	4	7	1	5	6
Silicon Data: Set #1	Silicon Data: Set #1 (moles Feldspar/cm <sup>2</sup> )								
1.08E+04	1.15E-10	2.81E-10	4.04E-08	2.10E-08	2.28E-10	7.44E-10	9.78E-11	5.33E-10	9.52E-10
3.24E+04	1.77E-10	4.94E-10	5.32E-08	5.31E-08	3.05E-10	1.23E-09	1.54E-10	7.12E-10	1.42E-09
7.74E+04	3.50E-10	7.26E-10	7.77E-08	1.19E-07	4.16E-10	2.16E-09	2.05E-10	1.28E-09	2.22E-09
1.22E+05	3.90E-10	9.29E-10	9.85E-08	1.72E-07	4.95E-10	2.84E-09	2.40E-10	1.63E-09	2.79E-09
1.62E+05	4.19E-10	1.04E-09	1.14E-07	2.14E-07	5.52E-10	3.44E-09	2.74E-10	1.94E-09	3.25E-09
2.07E+05	4.90E-10	1.25E-09	1.32E-07	2.55E-07	6.29E-10	4.08E-09	3.10E-10	2.30E-09	3.75E-09
2.49E+05	5.66E-10	1.34E-09	1.41E-07	2.83E-07	6.93E-10	4.52E-09	3.38E-10	2.57E-09	4.26E-09
2.92E+05	6.18E-10	1.47E-09	1.52E-07	3.04E-07	7.46E-10	5.12E-09	3.62E-10	2.81E-09	4.71E-09
3.33E+05	6.32E-10	1.58E-09	1.61E-07	3.30E-07	7.86E-10	5.42E-09	3.91E-10	3.06E-09	5.03E-09
3.81E+05	7.11E-10	1.78E-09	1.76E-07	3.52E-07	8.41E-10	5.88E-09	4.09E-10	3.31E-09	5.38E-09
4.20E+05	7.34E-10	1.86E-09	1.85E-07	3.68E-07	8.98E-10	6.31E-09	4.39E-10	3.55E-09	5.79E-09
4.72E+05	7.71E-10	2.08E-09	1.94E-07	3.98E-07	9.54E-10	6.97E-09	4.77E-10	3.78E-09	6.16E-09
5.11E+05	8.56E-10	2.29E-09	2.01E-07	4.04E-07	9.97E-10	7.32E-09	4.94E-10	3.95E-09	6.33E-09
5.51E+05			2.05E-07	4.12E-07	1.02E-09	7.58E-09	5.15E-10	4.07E-09	6.52E-09
5.98E+05	9.30E-10	2.49E-09	2.11E-07	4.16E-07	1.08E-09	7.92E-09	5.36E-10	4.26E-09	7.02E-09
6.40E+05					1.13E-09		5.74E-10	4.54E-09	7.24E-09
7.27E+05	1.11E-09	2.95E-09			1.25E-09		6.19E-10	4.92E-09	7.66E-09
9.01E+05	1.30E-09	3.55E-09			1.46E-09		7.36E-10	5.68E-09	8.81E-09
9.84E+05					1.54E-09		7.75E-10	5.93E-09	9.31E-09
1.17E+06					1.82E-09		9.14E-10	6.85E-09	1.06E-08
1.33E+06					1.97E-09		1.01E-09	7.59E-09	1.14E-08
1.52E+06					2.22E-09		1.17E-09	8.30E-09	1.26E-08
1.69E+06					2.42E-09		1.25E-09	8.89E-09	1.35E-08
1.87E+06					2.65E-09		1.34E-09	9.90E-09	1.43E-08



time (s)	Aluminum Data: Set #1						(moles Feldspar/cm <sup>2</sup> )								
	2	3	8	9	4	7	1	5	6						
1.08E+04	4.25E-10	1.91E-09	4.11E-08	1.72E-08	1.25E-09	3.16E-09	7.32E-10	1.50E-09	2.87E-09						
3.24E+04	5.09E-10	2.33E-09	5.99E-08	5.31E-08	1.50E-09	5.36E-09	7.97E-10	2.25E-09	4.31E-09						
7.74E+04	8.21E-10	2.72E-09	1.11E-07	1.22E-07	1.76E-09	8.76E-09	8.66E-10	3.33E-09	6.36E-09						
1.22E+05	1.00E-09	2.99E-09	1.30E-07	1.72E-07	1.81E-09	1.20E-08	9.03E-10	4.22E-09	8.04E-09						
1.62E+05	1.15E-09	3.16E-09	1.48E-07	2.10E-07	1.98E-09	1.45E-08	9.42E-10	5.07E-09	9.28E-09						
2.07E+05	1.22E-09	3.63E-09	1.59E-07	2.49E-07	2.08E-09	1.69E-08	9.59E-10	5.93E-09	1.06E-08						
2.49E+05	1.32E-09	3.55E-09	2.15E-07	2.74E-07	2.14E-09	1.88E-08	9.68E-10	6.95E-09	1.17E-08						
2.92E+05	1.38E-09	3.54E-09	2.28E-07	2.84E-07	1.78E-09	2.10E-08	9.82E-10	7.30E-09	1.29E-08						
3.33E+05	1.48E-09	3.85E-09	2.45E-07	3.08E-07	2.28E-09	2.16E-08	9.83E-10	7.88E-09	1.38E-08						
3.81E+05	1.54E-09	4.09E-09	2.61E-07	3.28E-07	2.40E-09	2.44E-08	9.71E-10	8.64E-09	1.49E-08						
4.20E+05	1.56E-09	4.28E-09	2.75E-07	3.27E-07	2.41E-09	2.58E-08	1.00E-09	9.04E-09	1.55E-08						
4.72E+05	1.63E-09	4.47E-09	2.91E-07	3.67E-07	2.51E-09	2.83E-08	1.00E-09	9.66E-09	1.61E-08						
5.11E+05	1.69E-09	4.64E-09	3.01E-07	3.79E-07	2.55E-09	2.95E-08	1.03E-09	1.01E-08	1.65E-08						
5.51E+05			3.35E-07	3.83E-07	2.57E-09	2.92E-08	1.03E-09	1.03E-08	1.71E-08						
5.98E+05	1.84E-09	5.09E-09	3.47E-07	3.80E-07	2.63E-09	3.15E-08	1.02E-09	1.07E-08	1.78E-08						
6.40E+05			3.49E-07	3.89E-07	2.69E-09	3.20E-08	1.03E-09	1.11E-08	1.81E-08						
7.27E+05	2.12E-09	5.88E-09			2.86E-09	3.90E-08	1.08E-09	1.21E-08	1.98E-08						
9.01E+05	2.36E-09	6.63E-09			3.22E-09	4.90E-08	1.19E-09	1.38E-08	2.20E-08						
9.84E+05					3.60E-09		1.23E-09	1.54E-08	2.31E-08						
1.17E+06					3.80E-09		1.38E-09	1.69E-08	2.59E-08						
1.33E+06					4.05E-09		1.43E-09	1.83E-08	2.80E-08						
1.52E+06					4.42E-09		1.53E-09	1.98E-08	3.12E-08						
1.69E+06					4.71E-09		1.64E-09	2.12E-08	3.36E-08						
1.87E+06					5.01E-09		1.75E-09	2.22E-08	3.49E-08						

time (s)	Calcium Data: Set #1 (moles Feldspar/cm <sup>2</sup> )								
	2	3	8	9	4	7	1		
1.08E+04	1.06E-08	2.18E-08	3.86E-08	2.18E-08	2.24E-08	8.52E-09	5.40E-07	1.98E-08	1.62E-08
3.24E+04	1.27E-08	1.49E-08	5.98E-08	6.39E-08	2.16E-08	6.78E-09	5.45E-07	1.88E-08	1.58E-08
7.74E+04	8.97E-09	8.96E-09	9.76E-08	1.17E-07	2.09E-08	1.05E-08	5.37E-07	1.72E-08	1.69E-08
1.22E+05	8.62E-09	2.09E-08	1.29E-07	1.66E-07	1.87E-08	1.57E-08	4.91E-07	1.76E-08	1.75E-08
1.62E+05	8.16E-09	1.26E-08	1.55E-07	2.06E-07	2.01E-08	1.59E-08	4.69E-07	1.81E-08	2.20E-08
2.07E+05	9.03E-09	1.94E-08	1.77E-07	2.47E-07	1.93E-08	2.20E-08	5.47E-07	1.98E-08	2.00E-08
2.49E+05	7.69E-09	1.99E-08	1.95E-07	2.82E-07	1.81E-08	2.13E-08	5.04E-07	2.05E-08	1.97E-08
2.92E+05	7.78E-09	1.60E-08	2.16E-07	2.98E-07	1.74E-08	2.41E-08	4.77E-07	2.03E-08	2.30E-08
3.33E+05	7.53E-09	1.84E-08	2.33E-07	3.09E-07	1.72E-08	2.40E-08	4.28E-07	1.98E-08	2.40E-08
3.81E+05	6.40E-09	8.09E-09	2.46E-07	3.35E-07	1.66E-08	2.72E-08	4.00E-07	2.06E-08	2.48E-08
4.20E+05	6.65E-09	1.80E-08	2.65E-07	3.42E-07	1.58E-08	2.75E-08	3.64E-07	1.89E-08	2.69E-08
4.72E+05	6.67E-09	1.54E-08	2.80E-07	3.60E-07	1.54E-08	3.06E-08	4.02E-07	2.03E-08	2.64E-08
5.11E+05	6.69E-09	1.53E-08	2.82E-07	3.64E-07	1.48E-08	3.11E-08	3.62E-07	2.00E-08	2.62E-08
5.51E+05			2.94E-07	3.81E-07	1.44E-08	3.25E-08	3.92E-07	1.98E-08	2.55E-08
5.98E+05	3.85E-09	8.97E-09	3.08E-07	4.10E-07	1.32E-08	3.16E-08	3.52E-07	2.05E-08	2.71E-08
6.40E+05			3.18E-07	4.00E-07	1.41E-08	4.00E-08	3.11E-07	2.18E-08	2.80E-08
7.27E+05	9.32E-09	2.68E-08			1.53E-08	3.88E-08	3.39E-07	2.40E-08	3.00E-08
9.01E+05	8.84E-09	2.45E-08			1.49E-08	4.66E-08	4.00E-07	2.51E-08	3.45E-08
9.84E+05					1.54E-08		3.15E-07	2.69E-08	3.41E-08
1.17E+06					1.48E-08		3.30E-07	2.94E-08	3.61E-08
1.33E+06					1.55E-08		3.07E-07	3.00E-08	3.96E-08
1.52E+06					1.49E-08		2.61E-07	3.05E-08	3.98E-08
1.69E+06					1.55E-08		2.68E-07	3.13E-08	4.44E-08
1.87E+06					1.48E-08		2.72E-07	3.17E-08	4.44E-08

time (s)	2	3	8	9	4	(moles Feldspar/cm <sup>2</sup> ) 7	1	5	6
1.08E+04	7.98E-09	2.46E-08	4.24E-07	4.30E-07	5.04E-09	5.82E-08	3.44E-09	1.87E-08	2.65E-08
3.24E+04	1.04E-08	2.53E-08	4.11E-07	4.70E-07	5.53E-09	5.61E-08	3.58E-09	2.16E-08	3.78E-08
7.74E+04	8.77E-09	2.60E-08	4.18E-07	5.90E-07	5.59E-09	5.52E-08	4.39E-09	2.35E-08	2.96E-08
1.22E+05	7.89E-09	2.94E-08	4.75E-07	6.19E-07	5.38E-09	5.37E-08	4.06E-09	2.36E-08	3.40E-08
1.62E+05	9.13E-09	2.76E-08	5.09E-07	6.72E-07	5.96E-09	6.17E-08	3.97E-09	2.14E-08	3.29E-08
2.07E+05	9.05E-09	3.03E-08	5.32E-07	6.74E-07	5.85E-09	6.42E-08	3.82E-09	2.46E-08	3.62E-08
2.49E+05	9.97E-09	2.87E-08	5.65E-07	6.72E-07	5.99E-09	6.43E-08	4.00E-09	2.72E-08	3.24E-08
2.92E+05	9.99E-09	2.56E-08	5.53E-07	7.06E-07	6.24E-09	7.23E-08	3.81E-09	3.60E-08	4.20E-08
3.33E+05	9.91E-09	2.79E-08	5.94E-07	7.38E-07	5.65E-09	7.16E-08	4.11E-09	2.51E-08	3.78E-08
3.81E+05	1.01E-08	2.57E-08	5.76E-07	7.32E-07	5.73E-09	7.67E-08	3.95E-09	2.81E-08	4.29E-08
4.20E+05	1.07E-08	2.88E-08	6.11E-07	7.19E-07	6.44E-09	7.47E-08	4.12E-09	3.21E-08	4.45E-08
4.72E+05	8.87E-09	3.09E-08	6.36E-07	8.66E-07	5.95E-09	7.74E-08	3.60E-09	2.59E-08	3.93E-08
5.11E+05	8.45E-09	2.62E-08	6.35E-07	8.53E-07	6.66E-09	7.79E-08	3.73E-09	2.87E-08	3.98E-08
5.51E+05			6.69E-07	7.84E-07	6.15E-09	8.16E-08	4.02E-09	2.53E-08	3.39E-08
5.98E+05	8.94E-09	2.96E-08	6.47E-07	8.26E-07	6.81E-09	7.72E-08	3.83E-09	2.59E-08	3.69E-08
6.40E+05			6.67E-07	8.38E-07	6.61E-09	7.83E-08	3.86E-09	3.00E-08	3.83E-08
7.27E+05	9.37E-09	3.04E-08			7.20E-09	8.17E-08	3.89E-09	3.08E-08	4.01E-08
9.01E+05	1.06E-08	2.90E-08			7.86E-09	8.90E-08	5.06E-09	2.85E-08	4.20E-08
9.84E+05					1.00E-08		4.49E-09	3.07E-08	4.63E-08
1.17E+06					7.85E-09		4.74E-09	3.25E-08	4.84E-08
1.33E+06					8.79E-09		4.05E-09	3.69E-08	5.99E-08
1.52E+06					8.64E-09		4.72E-09	3.53E-08	5.27E-08
1.69E+06					1.08E-08		4.37E-09	3.73E-08	5.21E-08
1.87E+06					8.49E-09		4.61E-09	3.77E-08	5.20E-08

time (s)	2	3	8	9	4	7	1	5	6
4.59E+04	2.53E-10	5.05E-10	4.22E-08	7.28E-08	5.52E-10	1.64E-09	1.60E-10	1.07E-09	1.94E-09
8.73E+04	4.24E-10	7.01E-10	5.15E-08	1.17E-07	6.66E-10	2.63E-09	3.06E-10	1.56E-09	2.63E-09
1.31E+05	3.36E-10	7.07E-10	5.48E-08	1.45E-07	7.18E-10	3.26E-09	1.83E-10	1.71E-09	3.02E-09
1.74E+05	6.70E-10	1.05E-09	6.46E-08	1.84E-07	9.41E-10	4.18E-09	4.21E-10	2.32E-09	3.72E-09
2.17E+05	5.54E-10	1.14E-09	7.22E-08	2.05E-07	1.16E-09	4.88E-09	4.71E-10	2.74E-09	4.26E-09
2.65E+05	6.12E-10	1.38E-09	7.52E-08	2.29E-07	1.26E-09	5.47E-09	5.29E-10	3.14E-09	4.98E-09
3.05E+05	6.99E-10	1.43E-09	7.95E-08	2.51E-07	1.17E-09	5.90E-09	5.33E-10	3.31E-09	5.22E-09
3.48E+05									
3.92E+05									

time (s)	2	3	8	9	4	7	1	5	6
4.59E+04	8.28E-10	2.33E-09	5.30E-08	6.36E-08	2.54E-09	6.57E-09	8.68E-10	3.18E-09	6.18E-09
8.73E+04	1.05E-09	2.72E-09	7.27E-08	1.12E-07	2.70E-09	1.07E-08	9.33E-10	4.51E-09	8.44E-09
1.31E+05	1.16E-09	2.90E-09	8.04E-08	1.38E-07	2.78E-09	1.39E-08	9.49E-10	5.43E-09	9.72E-09
1.74E+05	1.52E-09	3.41E-09	9.16E-08	1.67E-07	3.09E-09	1.68E-08	1.01E-09	6.86E-09	1.22E-08
2.17E+05	1.56E-09	3.70E-09	1.00E-07	1.88E-07	3.21E-09	1.85E-08	9.89E-10	7.43E-09	1.33E-08
2.65E+05	1.72E-09	4.02E-09	1.12E-07	2.16E-07	3.69E-09	2.15E-08	1.02E+00	8.71E-09	1.54E-08
3.05E+05	1.77E-09	3.93E-09	1.20E-07	2.31E-07	3.31E-09	2.30E-08	1.01E+00	9.21E-09	1.63E-08
3.48E+05	1.84E-09	3.97E-09	1.33E-07	2.61E-07	3.49E-09	2.47E-08	1.04E+00	9.70E-09	1.58E-08
3.92E+05	1.92E-09	4.03E-09	1.37E-07	2.63E-07	3.57E-09	2.43E-08	1.05E+00	1.02E-08	1.66E-08

SECTION 4

Thin sections of the feldspars before crushing, and the powder after purification, are described in this section. Virtually all of the feldspars exhibit polysynthetic and Carlsbad twinning.

- 1) Keystone Albite - The uncrushed material consists of white, polycrystalline albite from Keystone, SD. Grains in the polycrystalline sample were subhedral and approximately 1x10x20-40 mm in size. Trace amounts of euhedral to subhedral apatite, muscovite and K-feldspar were present as crystals several tens of microns in size. After purification, this sample contained 5 percent accessory minerals, which was dominantly microcrystalline muscovite.
- 2) Mitchell County Oligoclase - The sample was acquired as large crystals from Mitchell Co., NC. Each crystal was several centimeters long and contained muscovite phenocrysts which could be easily removed. Anhedral K-feldspar, however, was present at 2-3 volume percent as exsolution lamellae (<100 microns wide). Some muscovite and epidote inclusions were also present in 1-2 volume percent. The purified powder still contained about 4 percent of these accessory phases.
- 4) Ontario Albite - Large, single crystals of translucent oligoclase were acquired from Ontario, Canada. The crystals contain anhedral exsolution lamellae of potassium feldspar (<50 micrometers thick) as well as trace, muscovite, quartz and hornblende crystals. The purified powder contained these accessory phases at 2-3 volume percent.
- 5) Saranac Lake Andesine - The sample was acquired as black, polycrystalline andesine from Saranac Lake, NY. The material contains as much as 3-5 volume percent exsolution lamellae (<10mm wide) and small (10 x 30 micrometer) acicular or lath-shaped crystals of K-feldspar. The material also contains traces of clinzoisite, hornblende, and large (<1mm) anhedral crystals of magnetite-ilmenite, anhedral quartz, and polycrystalline muscovite. This sample is the least pure of all used in this study, containing 5-7 volume percent accessory phases.
- 7) Pueblo Park Bytownite - Clear crystals of labradorite ranged in size up to several centimeters. The crystals are optically clear and nearly unzoned. After purification, this powder contains less than one percent accessory minerals. The dominant impurity was iron hydroxide.
- 8) Crystal Bay Bytownite - Sample consists of translucent, polycrystalline bytownite from Crystal Bay, MN. Individual grains range in size up to several millimeters. The material contains trace amounts of exsolved potassium-rich feldspar (<30 microns wide), as well as hornblende, garnet, and magnetite. The purified powder contained much less than 2 percent of these accessory phases by volume.
- 9) Grass Valley Anorthite - White, polycrystalline anorthite crystals were separated from an anorthosite. This anorthosite contained up to 30-40 volume percent hedenbergite and olivine, most of which was removed during purification. Trace amounts of an exsolved feldspar were present in the separated plagioclase (<20 microns wide), and the separated plagioclase also contained traces of magnetite, hornblende and clinzoisite. After purification, the powder contains approximately five percent accessory minerals.