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K- La C (m)	3 1918 2751 77	. 6 1324 2017 74	3 3381 5139 143	8 814 1535 72	. 8 585 1420 84	051 2052 270 8	8 751 1344 52	. 3 1065 1978 83	.1 1088 1794 63	1271 2162 92	. 4 1936 3050 194 0 1 20	. U 1430 2/2/ 10-	9 1957 5822 857	4 2622 4674 170	9 999 3838 221	0 2208 5622 296	. 9 2440 4727 195 8 2018 4759 246	198 6007 1811 7	3 664 2826 188	0. 1138 2014 66	2 754 1121 33	. 6. 951 3111 141	433 778 32	888 691 23	.7 1063 4224 222	. 8 463 972 38	7 841 2712 140 9 450 750 750 94	250 1010	0 1462 3251 15	0 1828 3808 16	.2 905 1756 7	8 1007 1991 8	0 1051 2700 133	. 0 2224 5091 243	0 998 2527 126	0 1189 2864 142	0 1197 2434 10	5 1422 2718 10
ick- La C ss(m)	4.3 1918 2751 77	. 6 1324 2017 74	3 3381 5139 143	8 814 1535 72	. 8 585 1420 84	3 1543 2905 190	8 751 1344 52	. 3 1065 1978 83	.1 1088 1794 63	1271 2162 92	. 4 1936 3050 194 0 1 20	. U 1430 2/2/ 10-	9 1957 5822 857	4 2622 4674 170	9 999 3838 221	0 2208 5622 296	. 9 2440 4727 195 8 2018 4759 246	198 1967 1811 7	3 664 2826 1888	0. 1138 2014 66	2 754 1121 33	. 6. 951 3111 141	433 778 32	888 691 23	.7 1063 4224 222	. 8 463 972 38	7 841 2712 140 9 450 796 94	250 1010	0 1462 3251 15	0 1828 3808 16	.2 905 1756 7	8 1007 1991 8	0 1051 2700 133	. 0 2224 5091 243	0 998 2527 126	0 1189 2864 142	0 1197 2434 10	5 1422 2718 10
hick- La C ess(m)	4.3 1918 2751 77	. 6 1324 2017 74	3 3381 5139 143	8 814 1535 72	. 8 585 1420 84	051 2052 270 8	8 751 1344 52	. 3 1065 1978 83	.1 1088 1794 63	1271 2162 92	. 4 1936 3050 194 0 1 20	. U 1430 2/2/ 10-	9 1957 5822 857	4 2622 4674 170	9 999 3838 221	0 2208 5622 296	. 9 2440 4727 195 8 2018 4759 246	198 1967 1811 7	3 664 2826 188	0. 1138 2014 66	2 754 1121 33	. 6. 951 3111 141	433 778 32	888 691 23	.7 1063 4224 222	. 8 463 972 38	7 841 2712 140 9 450 750 750 94	250 1010	0 1462 3251 15	0 1828 3808 16	.2 905 1756 7	8 1007 1991 8	0 1051 2700 133	. 0 2224 5091 243	0 998 2527 126	0 1189 2864 142	0 1197 2434 10	5 1422 2718 10
hick- La C ess(m)	4.3 1918 2751 77	. 6 1324 2017 74	3 3381 5139 143	8 814 1535 72	. 8 585 1420 84	051 2052 270 8	8 751 1344 52	. 3 1065 1978 83	.1 1088 1794 63	1271 2162 92	. 4 1936 3050 194 0 1 20	. U 1430 2/2/ 10-	9 1957 5822 857	4 2622 4674 170	9 999 3838 221	0 2208 5622 296	. 9 2440 4727 195 8 2018 4759 246	198 1967 1811 7	3 664 2826 188	0. 1138 2014 66	2 754 1121 33	. 6. 951 3111 141	433 778 32	888 691 23	.7 1063 4224 222	. 8 463 972 38	7 841 2712 140 9 450 750 750 94	250 1010	0 1462 3251 15	0 1828 3808 16	.2 905 1756 7	8 1007 1991 8	0 1051 2700 133	. 0 2224 5091 243	0 998 2527 126	0 1189 2864 142	0 1197 2434 10	5 1422 2718 10
h Thick- La C ness(m)	4. 3 1918 2751 77	4.6 1324 2017 74	3, 3, 3, 3, 3, 1, 5, 1, 6, 3	8.88 81.4	4.8 585 1420 84	6.3 1543 2905 190 6.3 1543 2905 190	6.8 751 1344 55	6.3 1065 1978 83	3.1 1088 1794 63	1271 2162 92	# 4 1980 8000 1884	0.0 1480 2.77 TO	3 9 1957 5822 357	7.4 2622 4674 170	1,9 999 3838 221	5.0 2208 5622 296	2.8 2440 4727 195 7 4 2018 4759 246	134 COD 4 COD 4 C	2.3 664 2826 188	5 0 1138 2014 66	4.2 754 1121 83	3.6 951 3111 141	6.4 433 778 32	6.8 388 691 23	5.7 1063 4224 222	5.8 463 972 33	3.7 941 2712 140 9 9 450 790 94	829 1919 79	5.0 1462 3251 15	5.0 1828 3808 16	4.2 905 1756 7	4.8 1007 1991 8	5.0 1051 2700 133	5.0 2224 5091 243	5.0 998 2527 126	5.0 1189 2864 142	5.0 11.97 2434 10	3.5 1422 2718 10
th Thick— La C ) ness(m)	2 4.3 1918 2751 77	8 4.6 1324 2017 74	3, 3, 3, 3, 3, 3, 1, 4, 3	3.8 814 1535 72	2 4.8 585 1420 84 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	9 4.4 066 1912 09 9 6.3 1543 2905 190	7 6.8 751 1344 52	0 6.3 1065 1978 83	1 3.1 1088 1794 63	5) 1271 2152 92	4.4 1936 3000 194	4 0.0 1440 2.72 10.0	3 9 1957 5822 257	3 7.4 2622 4674 170	1, 9 999 3838 221	2 5.0 2208 5622 296	1 2.9 2440 4727 195 5 7 8 9018 4759 976	0 42 0012 4010 4 7 0010 361	2 2.3 664 2826 188	5) 1883 4306 662 5 0 1138 2014 66	7 4.2 754 1121 83	3 3.6 951 3111 141	0 4.0 2030 0000 104	8 888 691 23	5 5.7 1063 4224 222	3 5.8 463 972 33	0 3.7 941 2712 140 9 9 450 790 94	829 1919 79	8 5.0 1462 3251 15	8 5.0 1828 3808 16	0 4.2 905 1756 7	7 4.8 1007 1991 8	7 5.0 1051 2700 133	7 5.0 2224 5091 243	7 5.0 998 2527 126	7 5.0 1189 2864 142	7 5.0 1197 2434 10	2 3.5 1422 2718 10
pth Thick- La C m) ness(m)	2 4.3 1918 2751 77	.8 4.6 1324 2017 74	3. 3 3381 5139 143	8 8 8 12 1535 12	. 2 4.8 585 1420 84	. 9 4. 4 0.22 1912 93 9 6.3 1543 2905 190	7 6.8 751 1344 55	.0 6.3 1065 1978 83	.1 3.1 1088 1794 63	65) 1271 2152 92	. 4 4.4 1930 3000 1944 . n	2 1 1 1 1 4 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1	9 4 957 5822 EGG	3 7.4 2622 4674 170	2 1.9 999 3838 221	2 5.0 2208 5622 296	. 1 2.9 2440 4727 195 5 7 7 9018 7759 976		2 2.3 664 2826 188	68) 1083 4304 444 5 0 1138 2014 66	7 4.2 754 1121 83	. 3 3.6 951 3111 141	. 0 4. 0 2030 5050 104 0 6. 4 433 778 32	8 8 888 691 23	5 5.7 1063 4224 222	. 3 5. 8 463 972 38	9 9 7 941 2712 140	es) 829 1919 79	8 5.0 1462 3251 15	8 5.0 1828 3808 16	.0 4.2 905 1756 7	.7 4.8 1007 1991 8	7 5.0 1051 2700 133	.7 5.0 2224 5091 243	7 5.0 998 2527 126	7 5.0 1189 2864 142	7 5.0 1197 2434 10	2 3.5 1422 2718 10
pth Thick- La C m) ness(m)	7.2 4.3 1918 2751 77	1.8 4.6 1324 2017 74	5. 1 8. 8 8381 5189 143	3.88814 1535 72	3. 2 4. 8 585 1420 84	3 9 6 3 1543 2905 1914 00 3 9 6 3 1543 2905 190	0.7 6.8 751 1344 55	7.0 6.3 1065 1978 83	0.1 3.1 1088 1794 63	les) 1271 2162 92	6.4 4.4 1930 3000 1944	1.4 0.0 1480 2/2/ 10/ 5 5 1878 2/08 105	8 9 1857 5822 857	6.3 7.4 2622 4674 170	8. 2 1. 9 999 3838 221	3. 2 5. 0 2208 5622 296	6.1 2.9 2440 4/2/ 195 2 5 7 7 9 9012 4759 9/6		2 2.3 664 2826 188	683	0.7 4.2 754 1121 83	4.3 3.6 951 3111 141	5.0 4.0 2030 0000 104 5.0 6.4 433 778 32	1.8 6.8 388 691 23	7.5 5.7 1063 4224 222	3.3 5.8 463 972 38	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10.5 4400 1919 79 10.5 1919 79	6.8 5.0 1462 3251 15	1.8 3808 16	6.0 4.2 905 1756 7	1.7 4.8 1007 1991 8	6.7 5.0 1051 2700 133	1.7 5.0 2224 5091 243	6.7 5.0 998 2527 126	1.7 5.0 1189 2864 142	6.7 5.0 1197 2434 10	2 3.5 1422 2718 10
epth Thick— La C (m) ness(m)	7.2 4.3 1918 2751 77	1.8 4.6 1324 2017 74	5. 1 8. 8 8381 5189 143	3.88814 1535 72	3. 2 4. 8 585 1420 84	3 9 6 3 1543 2905 1914 00 3 9 6 3 1543 2905 190	0.7 6.8 751 1344 55	7.0 6.3 1065 1978 83	50.1 3.1 1088 1794 63	mples) 1271 2152 92	10.4 4.4 1930 3000 1944	1.4 0.0 1480 2/2/ 10/ 5 5 1878 2/08 105	8 9 1857 5822 857	6.3 7.4 2622 4674 170	8. 2 1. 9 999 3838 221	3. 2 5. 0 2208 5622 296	6.1 2.9 2440 4/2/ 195 2 5 7 7 9 9012 4759 9/6		50.2 2.3 664 2826 188	#Dies/ 188 4306 646	0.7 4.2 754 1121 83	4.3 3.6 951 3111 141	5.0 4.0 2030 0000 104 5.0 6.4 433 778 32	1.8 6.8 388 691 23	7.5 5.7 1063 4224 222	3.3 5.8 463 972 38	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	moles) 829 1919 79	6.8 5.0 1462 3251 15	1.8 3808 16	6.0 4.2 905 1756 7	1.7 4.8 1007 1991 8	6.7 5.0 1051 2700 133	1.7 5.0 2224 5091 243	6.7 5.0 998 2527 126	1.7 5.0 1189 2864 142	6.7 5.0 1197 2434 10	50.2 3.5 1422 2718 10
∼Depth Thick La C (m) ness(m)	7.2 4.3 1918 2751 77	1.8 4.6 1324 2017 74	5. 1 8. 8 8381 5189 143	3.88814 1535 72	3. 2 4. 8 585 1420 84	3 9 6 3 1543 2905 1914 00 3 9 6 3 1543 2905 190	0.7 6.8 751 1344 55	7.0 6.3 1065 1978 83	50.1 3.1 1088 1794 63	amples) 1271 2152 92	10.4 4.4 1930 3000 1944	1.4 0.0 1480 2/2/ 10/ 5 5 1878 2/08 105	8 9 1857 5822 857	6.3 7.4 2622 4674 170	8. 2 1. 9 999 3838 221	3. 2 5. 0 2208 5622 296	6.1 2.9 2440 4/2/ 195 2 5 7 7 9 9012 4759 9/6		50.2 2.3 664 2826 188	ampres) 1083 4304 444 6 5 5 0 1138 2014 66	0.7 4.2 754 1121 83	4.3 3.6 951 3111 141	5.0 4.0 2030 0000 104 5.0 6.4 433 778 32	1.8 6.8 388 691 23	7.5 5.7 1063 4224 222	3.3 5.8 463 972 38	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2000 2000 2000 2000 2000 2000 2000 200	6.8 5.0 1462 3251 15	1.8 3808 16	6.0 4.2 905 1756 7	1.7 4.8 1007 1991 8	6.7 5.0 1051 2700 133	1.7 5.0 2224 5091 243	6.7 5.0 998 2527 126	1.7 5.0 1189 2864 142	6.7 5.0 1197 2434 10	50.2 3.5 1422 2718 10
th~Depth Thick~ La C ) (m) ness(m)	9 7.2 4.3 1918 2751 77	2 11.8 4.6 1324 2017 74	8 15.1 8.3 8381 5139 143	3.8 814 1535 72	23.2 4.8 585 1420 84 55 57 6 4 6 6 6 7 1513 6 6	6 23 9 6 8 1543 2905 190	9 40.7 6.8 751 1344 52	7 47.0 6.3 1055 1978 83	0 50.1 3.1 1088 1794 63	Samples) 1271 2162 92	6	4 11.4 0.0 1430 2/2/10/	2 10 0 10 10 10 10 10 10 10 10 10 10 10 1	9 26.3 7.4 2622 4674 170	3 28.2 1.9 999 3838 221	2 33. 2 5. 0 2208 5622 296	2 36.1 2.9 2440 4727 193 1 42 K 7 4 9018 4759 946	54 40 4 4 1 131 4 10 10 4 10 10 10 10 10 10 10 10 10 10 10 10 10	9 50.2 2.3 664 2826 188	5 5 6 5 5 0 1138 2014 66	5 10.7 4.2 754 1121 33	7 14.3 3.6 951 3111 141	6 10.0 4.0 2030 0000 104 6 25 0 6 4 433 778 32	0 31.8 6.8 388 691 23	8 37.5 5.7 1063 4224 222	5 43.3 5.8 463 972 38	3 47 0 3.7 941 2712 140	Samoles) 829 1919 79	8 6.8 5.0 1462 3251 15	8 11.8 5.0 1828 3808 16	8 16.0 4.2 905 1756 7	9 21.7 4.8 1007 1991 8	7 26.7 5.0 1051 2700 133	7 31.7 5.0 2224 5091 243	7 36.7 5.0 998 2527 126	7 41.7 5.0 1189 2864 142	7 46.7 5.0 1197 2434 10	7 50.2 3.5 1422 2718 10
pth-Depth Thick- La C m) ness(m)	. 9 7. 2 4. 3 1918 2751 77	. 2 11.8 4.6 1324 2017 74	8 15.1 8.8 8381 5189 143	3.8 814 1535 72	2. 2. 2. 4. 8. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5.	6 33 9 6 33 9 8 33 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	.9 40.7 6.8 751 1344 52	.7 47.0 6.3 1055 1978 83	.0 50.1 3.1 1088 1794 63	0 Samples) 1271 2152 92	. C	. 4 . 11. 4 . 0. U 1480 2 (2) 10. U	2 10 10 0 10 10 10 10 10 10 10 10 10 10 1	9 26.3 7.4 2622 4674 170	3 28.2 1.9 999 3838 221	2 33.2 5.0 2208 5622 296	. 2 36.1 2.9 2440 4727 190 1 12 K 7 1 2018 1759 216	2	20.2 2.3 664 2826 188	1 Samples) 1683 4396 666 5 6 1138 2014 66	5 10.7 4.2 754 1121 33	. 7 14.3 3.6 951 3111 141	6 25 0 6 4 433 778 32	0 31.8 6.8 388 691 23	8 37.5 5.7 1063 4224 222	. 5 43.3 5.8 463 972 38	3 47.0 3.7 941 2712 140	0 Samples) 829 1919 79	8 6 8 5 0 1462 3251 15	.8 11.8 5.0 1828 3808 16	.8 16.0 4.2 905 1756 7	9 21.7 4.8 1007 1991 8	7 26.7 5.0 1051 2700 133	7 31.7 5.0 2224 5091 243	7 36.7 5.0 998 2527 126	7 41.7 5.0 1189 2864 142	7 46.7 5.0 1197 2434 10	7 50.2 3.5 1422 2718 10
epth Depth Thick La C	2.9 7.2 4.3 1918 2751 77	7.2 11.8 4.6 1324 2017 74	1.8 15.1 8.8 8381 5189 143	5. 3. 8 814 1535 72	8.4 23.2 4.8 585 1420 84 9 9 9 7 6 4 9 9 9 1519 69	3 6 33 9 6 3 1543 2905 190	3.9 40.7 6.8 751 1344 52	0.7 47.0 6.3 1065 1978 83	7.0 50.1 3.1 1088 1794 63	10 Samples) 1271 2162 92	2. C	0. 4 11. 4 0. U 1480 6.67 10.	5.0 18.9 3.9 1957 5822 357	8.9 26.3 7.4 2622 4674 170	6.3 28.2 1.9 999 3838 221	8. 2 33. 2 5. 0 2208 5622 296	3.2 36.1 2.9 2440 4727 193 6 1 42 6 7 6 9018 4759 946	25 5 67 G 6 4 1131 400 351	7.9 50.2 2.3 664 2826 188	11 Samples) 1883 4394 444 1 5 6 5 5 0 1138 2014 66	6.5 10.7 4.2 754 1121 33	0.7 14.3 3.6 951 3111 141	8. 6 25.0 6.4 A33 778 32	5.0 31.8 6.8 388 691 23	1.8 37.5 5.7 1063 4224 222	7.5 43.3 5.8 463 972 38	3.3 47.0 3.7 941 2712 140	10 Samples) 829 1919 79	1.8 6.8 5.0 1462 3251 15	6.8 11.8 5.0 1828 3808 16	1.8 16.0 4.2 905 1756 7	6.9 21.7 4.8 1007 1993 8	1,7 26.7 5.0 1051 2700 133	6.7 31.7 5.0 2224 5091 243	17 36.7 5.0 998 2527 126	6 7 41 7 5.0 1189 2864 142	1.7 46.7 5.0 1197 2434 10	6.7 50.2 3.5 1422 2718 10
epth Depth Thick La C	2.9 7.2 4.3 1918 2751 77	7.2 11.8 4.6 1324 2017 74	1.8 15.1 8.8 8381 5189 143	5. 3. 8 814 1535 72	8.4 23.2 4.8 585 1420 84 9 9 9 7 6 4 9 9 9 1519 69	3 6 33 9 6 3 1543 2905 190	3.9 40.7 6.8 751 1344 52	0.7 47.0 6.3 1065 1978 83	7.0 50.1 3.1 1088 1794 63	10 Samples) 1271 2162 92	2. C	0. 4 11. 4 0. U 1480 6.67 10.	5.0 18.9 3.9 1957 5822 357	8.9 26.3 7.4 2622 4674 170	6.3 28.2 1.9 999 3838 221	8. 2 33. 2 5. 0 2208 5622 296	3.2 36.1 2.9 2440 4727 193 6 1 42 6 7 6 9018 4759 946	25 5 67 G 6 4 1131 400 351	20.2 2.3 664 2826 188	11 Samples) 1883 4394 444 1 5 6 5 5 0 1138 2014 66	6.5 10.7 4.2 754 1121 33	0.7 14.3 3.6 951 3111 141	8. 6 25.0 6.4 A33 778 32	5.0 31.8 6.8 388 691 23	1.8 37.5 5.7 1063 4224 222	7.5 43.3 5.8 463 972 38	3 47.0 3.7 941 2712 140	10 Samples) 829 1919 79	1.8 6.8 5.0 1462 3251 15	6.8 11.8 5.0 1828 3808 16	1.8 16.0 4.2 905 1756 7	6.9 21.7 4.8 1007 1993 8	1,7 26.7 5.0 1051 2700 133	6.7 31.7 5.0 2224 5091 243	17 36.7 5.0 998 2527 126	6 7 41 7 5.0 1189 2864 142	1.7 46.7 5.0 1197 2434 10	7 50.2 3.5 1422 2718 10
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## Appendix 3

## Microscopic observations and microphotographs

Microscopic Overvation (Polished thin section)

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	Rock Name	Syenite Sovite Ankeritic govite Apaite sovite Syenite	Nepheline syentre A.S.C. Phonolite A.S.C. Ankeritic sovite	Comptonite Lamprophyre Sideritic carbonatite Sideritic carbonatite Sideritic carbonatite	Ankeritic sovite Ankeritic sovite A.S.C. Sovite C.A.C.	Syenite Sovite Sovite Carbonstized aggl. Sovite	Iron oxide ore Altered neph. syenite Apaite rock A.S.C. Apatite rock	Bio. rich carbonatite Altered trachyte Fenitized syenite Penitized gneiss Sovite	Soute Syenite Syenite Alkali syenite Soute	A.S.C.: Altered siderific carbonatite C.A.C.: Contemination of alkall rock laced and an annual rock laced and an an an an an an an an an an an an an
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Sample No. CO709 Sector: Chilwa Is.

Rock name: Syenite Observation Note:

Mafic minerals are mainly presented as biotite (0.05 served. Clinopyroxene is closely associated with biotite and is and magnetite which is partly altered to goetite are also ob-Potassium feldspar occurs as an euhedral or subhedwhich is mostly altered is mainly composed of potassium feldspar Plagioclase shows comparatively to 0.9 mm in diameter) and clinopyroxene (less than 0.5 Small amount of sphene, apatite carbonate partly decomposed into carbonate minerals: of about 0.15 to 2.5 mm, and chlorite. The specimen plagioclase. ral grain occurence. diameter). muscovite



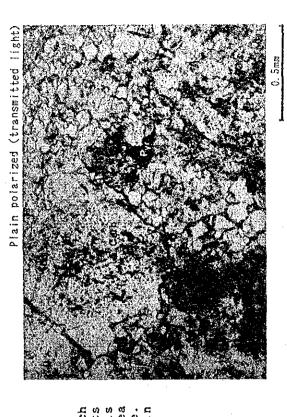
Plain polarized (transmitted light)

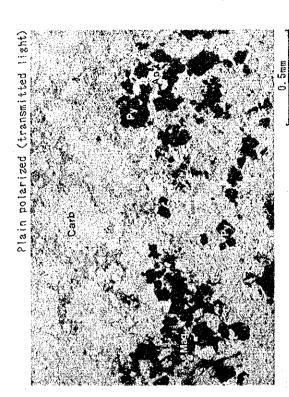
Sample No. C1208 Sector: Chilwa Is.

Rock name: Sovite Obsevation Note: The specimen shows porphyritic texture with euhedral to anhedral carbonate mineral (0.1 mm in diameter) and euhedral to subhedral fluorite (0.5 to 2.0 mm in diameter). Phenocrysts of carbonate minerals (0.5 to 2.0 mm in diameter) are also observed. Anhedral plugged quartz (0.1 to 0.2 mm in diameter) and barite, and anhedral dusty or granular magnetite which is partly altered to goetite are also rarely detected.

Sample No. C1304 Sector: Chilwa Is. Rock name: Ankeritic sovite Observation Note:

The specimen is mainly composed of carbonate mineral which occurs as a porphyritic texture. The porphyritic part consists of grains from 0.35 to 1.75 mm in diameter, and the matrix is formed by grains less than 0.15 mm in diameter. The area proportion between porphyritic and matrix parts are almost same. Dark green subhedral to anhedral pyroclore (less than 0.2 mm in diameter) and plugged quartz and magnetite are rarely detected.





Sample No. C1306 Sector: Chilwa Is.

Sector: Chilwa is. Rock name: Apatite Sovite Obsevation Note:

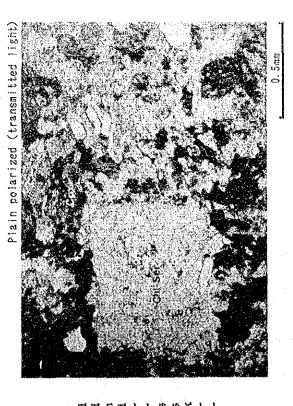
The specimen consists of two fine grained parts; carbonaterich and apatite-rich parts. The carbonate-rich part occurs as a granular mosaic texture with 0.05 to 0.5 mm in grain size. The apatite-rich part is very fine (less than 0.15 mm in diameter) and irregularly associates with plugged carbonate minerals.

A small amount of barite, quartz, pyrite, magnetite pyroclore is also observed, but barite is not detected in apatite-rich part;

No. C1607

Sector: Chilwa Is. Rock name: Syenite Observation Note:

potassium feldspar, and medical as an _______ Plagioclase occurs as an _______ Plagioclase occurs as an grained xene is euhedral to subhedral with light green in color, which is dark into Sericite (muscovite) + chlorite. Potassium feldspar is subeuhedral or subhedral grain and is almost completely decomposed anhedral to subhedral and platy shape with light brown or brown in color, which is associated with clinopyroxene. is generally anhedral and is altered to hematite. The specimen is mainly composed of medium to coarse hedral to anhedral and is mostly altered to albite. altered to carbonate + opaque minerals. tite, carbonate and sphene are rarely observed clinopyroxene, biotite and magnetite. and plagiociase netite partly





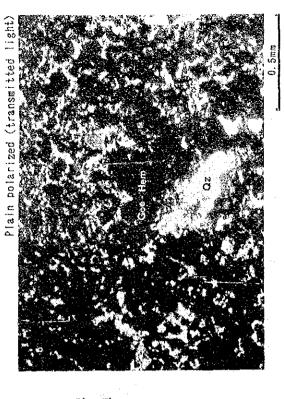
Sample No. C1610 Sector: Chilwa Is.

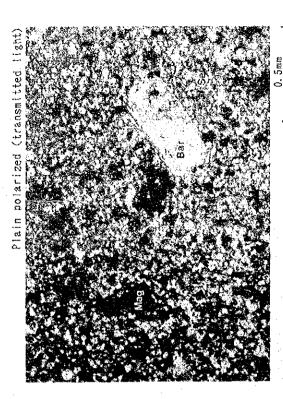
Rock name: Nepheline Syenite Observation Note:

as nepheline syenite which is composed of feldspar, biotite, clinopyroxene and pyrite. However, feldspar is almost completely altered to sericite and carbonate and only a few plagioclase is remained. Biotite is partly decomposed of plagioclase, carbonate, chlorite, sericite, magnetite and goetite. Clinopyroxene is also partly altered to carbonate, magnetite and goetite.

Sample No. C1901 Sector: Chilwa Is. Rock name: Altered Sideritic Carbonatite Observation Note:

The specimen is severely altered. Magnetite is decomposed into goetite and hematite along its grain surface and crack. Siderite is completely altered to goetite and carbonate. Plugged potassium feldspar and quartz are rarely observed.





Sample No. C2007. Sector: Chilwa Is. Rock name: Phonolite

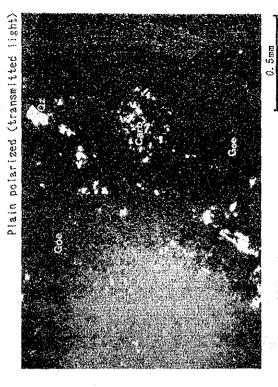
Observation Note:

The primary rock had most probably an intergranuler texture with feldspar and feldspathoid, but were completely altered to sericite. The specimen consists of euhedral to subhedral feldspar or feldspathoid, subhedral clinopyroxene and anhedral biotite. Phenocrysts of barite (0.6 mm in diameter) and biotite (less than 0.3 mm in diameter) are observed. Magnetite and secondary carbonate are also detected.

Sample No. C2106 Sector: Chilwa Is.

Rock name: Altered Sideritic Carbonatite Observation Note:

The specimen consists mainly of euhedral to subhedral magnetite and goetite. The texture shows porphyritic part (1.5 to 7 mm in grain size) and matrix part (less than 0.5 mm in grain size). Anhedral quartz (less than 0.3 mm), yellowish brown to colorless carbonate and potassium feldspar (less than 0.3 mm) are rarely observed in the matrix part.



Plain polarized (transmitted light)



Sample No. C2208 Sector: Chilwa Is.

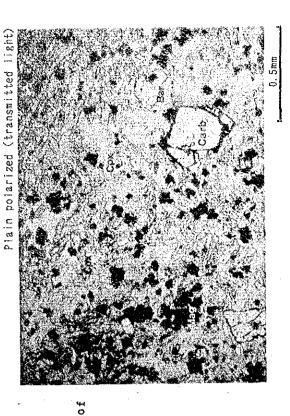
Rock name: Ankeritic Sovite Observation Note:

The specimen mainly consists of carbonate and shows porphyritic texture with 0.2 to 1.0 mm porphyritic part and very fine grained matrix. Euhedral to subhedral grains are common in the porphyritic part but anhedral in the matrix part. Siderite is involved in the matrix carbonate minerals. Anhedral to euhedral magnetite which is altered to goetite and hematite, and granular to plugged quartz are rarely observed.

Sample No. C2301

Sector: Chilwa Is. Rock name: Comptonite Observation Note:

The specimen shows a panidiomorphic texture and is composed of euhedral clinopyroxene, platy biotite, granular magnetite and plugged sericite. The other porphyritic mineral is also observed, which is completely decomposed into chlorite and carbonate except partly remained barite.



Plain polarized (transmitted light)

Sample No. C2404 Sector: Chilwa Is.

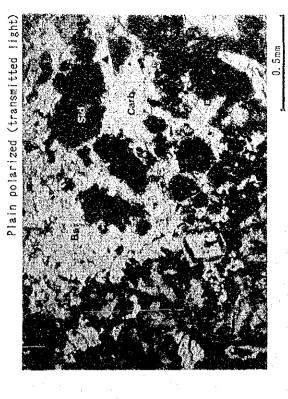
Rock name: Lamprophyre Observation Note:

The specimen shows a panidiomorphic texture with plagioclase (0.15 mm in diameter), platy biotite (ca.0.05 mm) and hornblende (ca. 0.05 mm). Biotite pseudomorphs displaced to chlorite and carbonate are observed. A small amount of magnetite and pyrite is present

Sample No. C2408

Sector: Chilwa Is. Rock name: Sideritic Carbonatite

of euhedral to subhedral light yellowish brown siderite (0.2 to 1.75 mm in diameter) and subordinate colorless carbonate. barite Phenocrysts Siderite shows a spherulitic texture and fluorite con-Opaque diameter). barite. texture. aggregates (less than 0.6 mm in as a pool (8 mm in diameter). groundmass is composed of siderite, shows a porphyritic mineral is little observed The specimen Observation Note: centrates occur as quartz. consist i e





Sample No. C2506 Sector: Chilwa Is.

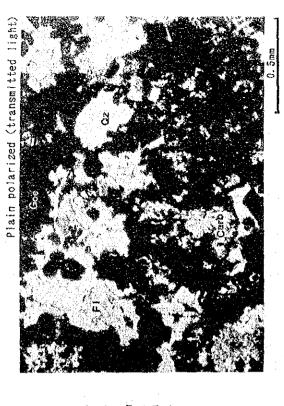
Rock name: Sideritic carbonatite Observation Note:

The specimen is severely altered. Magnetite is altered to goetite, and feldspar is decomposed into sericite. Aggregate of goetite and carbonate is also formed, which suggests siderite is the primary mineral. Magnetite, quartz, fluorite and barite are barely remained as the primary mineral.

Sample No. C2609 Sector: Chilwa Is.

Rock name: Sideritic carbonate Observation Note:

The specimen is mainly composed of magnetite, fluorite, quartz, potassium feldspar and carbonate. Magnetite is mostly altered to hematite and goetite. Aggregate of carbonate and goetite (0.2 mm in diameter) which is originated from siderite is observed. Fluorite is euchedral to anhedral and less than 0.7 mm in diameter. Pyroclore is rarely detected. Anhedral quartz and potassium feldspar occur as a vein or pool (less than 1.25 mm in diameter). Primary carbonate mineral is also observed as an anhedral grain of ca.0.3 mm in diameter.



Plain polarized (transmitted light)

Sample No. C2810

Sector: Chilwa Is. Rock name: Ankeritic Sovite

Observation Note:

The specimen shows a mosaic texture of colorless carbonate (0.1 to 0.25 mm in diameter). The other rock forming minerals are potassium feldspar, quartz, barite, fluorite and opaque mineral. Potassium feldspar generally forms an aggregate of fine grains including magnetite and carbonate. Opaque mineral involves euhedral to subhedral pyrite (0.07 to 0.7 mm in diameter) and magnetite (0.05 to 0.1 mm in diameter). A very few muscovite is also observed as the secondary mineral.

Sample No. C2904

Rock name: Ankeritic Sovite Sector: Chilwa Is Observation Note:

carbonate (0.1 to 0.7 mm in diameter). Anhedral granular quartz is subordinately present and forms an aggregate (0.2 to 0.7 mm in Subhedral to anhedral pyrite and magnetite which is anhedral granular severely altered to goetite are rarely observed. composed of is mostly carbonate (0.1 to 0.7 mm specimen diameter). The

Plain polarized (transmitted light)

Plain polarized (transmitted light)



Sector: Chilwa Is. Sample No. C2907

Rock name: Altered Sideritic Carbonatite

Observation Note:

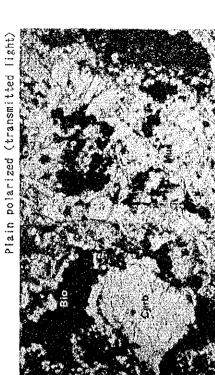
decomposed into goetite, and siderite into carbonate and goetite. which are both less than 0.2 No siderite is observed. Two types of carbonate minerals; color-Magnetite The specimen is altered severely. are present, less and brown grain, mm in diameter.

Sample No. C3003 Sector: Chilwa Is.

Rock name: Sovite Observation Note:

The specimen is mainly composed of carbonate (0.05 to 0.7 mm in diameter) with a mosaic texture. Barite, quartz and pyrite are subordinately present. Quartz is less than 0.2 mm indiameter and is accompanied with pyrite which is mostly alterecto goetite.





Sample No. C3009

Sector: Chilwa Is.

Rock name: Contamination of Alkali rock & Carbonatite

Observation Note:

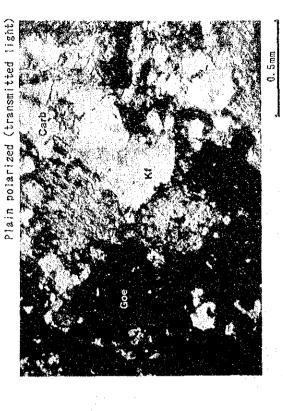
The specimen is composed of carbonate, muscovite, biotite and magnetite.

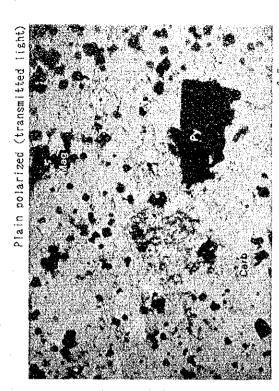
Carbonate is anhedral grain with less than 0.5 mm in diameter. Biotite shows a porphyritic occurrence and is altered to aggregate of recrystalized fine biotite. Magnetite partly shows a porphyritic texture and is decomposed into hematite, goetite, carbonate. Apatite and titan mineral are also observed a little.

Sample No. C3109 Sector: Chilwa Is.

Rock name: Syenite Observation Note:

The specimen is probably originated from a felspathic syenite (or trachyte), but the feldspar is mostly altered to sericite including kaoline. The mafic minerals are also altered to carbonate and goetite except a small amount of biotite, magnetite and apatite. Carbonate vein is observed.





Sample No. C3210 Sector: Chilwa Is.

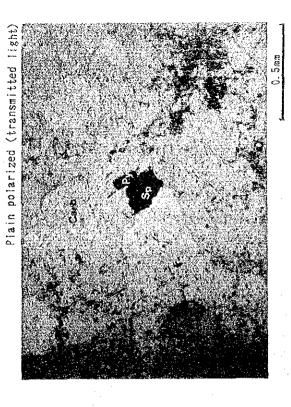
Rock name: Sovite

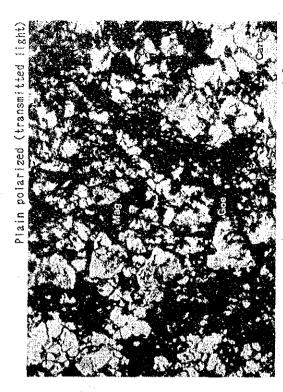
Observation Note:

The specimen is composed of carbonate with a mosaic texture (0.07 to 0.25 mm in diameter). Opaque mineral is partly distributed. It is euhedral to subhedral magnetite (0.3 mm in diameter) and pyrite (0.6 mm in diameter). Muscovite and pyroclore are the other rock forming minerals.

Sample No. C3211

Sector: Chilwa Is. Rock name: Sovite Observation Note: The specimen is mainly composed of anhedral granular carbonate (0.1 to 0.3 mm in diameter) with a mosaic texture. Apatite is partly concentrated and forms plugged aggregates. Zonated pyroclore (0.1 mm in diameter), sphalerite and pyrite is rarely observed.





Sample No. \$1404 Sector: Songwe

Rock name: Carbonized Agglomerate

Observation Note:

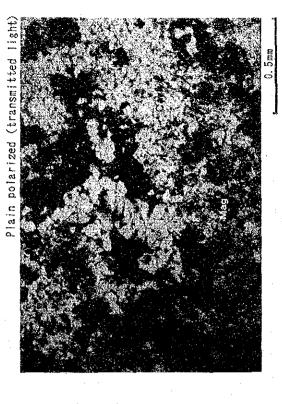
The specimen is mainly composed of carbonate, potassium feldspar and opaque mineral. Carbonate is anhedral granular (less than 0.3 mm in diameter) and potassium feldspar is euhedral to anhedral porphyritic (less than 1.1 mm in diameter). Opaque mineral is primarily magnetite but is altered to goetite. Dusty opaque is distributed in the matrix.

Sample No. S1510 Sector: Chilwa Is.

Rock name: Sovite

Observation Note:

The specimen is mainly composed of anhedral granular carbonate (0.05 to 0.45 mm in diameter) with a mosaic texture. Anhedral to euhedral magnetite and hematite are observed. Potassium feldspar altered to albite and light brown carbonate are also observed.



S. Line

Plain polarized (transmitted jight)

Sample No. S1604

Sector: Songwe

Rock name: Iron Oxide Ore Observation Note:

The specimen is mainly composed of euhedral to subhedral magnetite and hematite (less than 0.1 mm in diameter). Magnetite and hematite form roughly banded texture. Carbonate shows intergranular occurrence and the size is less than 0.2 mm in diameter. Barite is also rarely observed. These subordinate minerals are usually distributed in the part where magnetite and hematite is poor, and form aggregates with coarse grained carbonate.

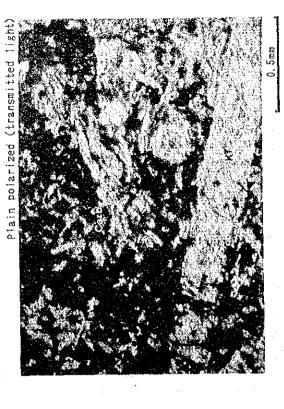
Sample No. S1907

Sector: Songwe

Rock name: Altered nepheline syenite

Observation Note:

decomposed into sericite, chlorite, hematite, goetite, carbonate The specimen had probably trachytic texture with phenocrysts and feldspathoid A small amount The groundmass and partly biotite without potassium feldspar. of fluorite is also observed. of felspar in the primary form, but feldspar were almost completely altered to albite.



Plain polarized (transmitted light)

Sample No. T2501

Rock name: Apatite Rock Sector: Tundulu

The specimen is mainly composed of apatite, quartz, carbonate and opaque mineral. Apatite is very rich and is euhedral (0.07 to 0.15 mm in diameter). Quartze is anhedral and the size is less than 0.6 mm in diameter. Opaque mineral is euhedral or subhedral (less than 2.5 mm in diameter), and is mostly altered Observation Note:

Sample No. 72606 Sector: Tundulu

Rock name: Altered Sideritic Carbonate

Observation Note:

carbonate. Granular quartz and carbonate less than 0.35 mm in diameter are Opaque mineral mostly consists of goetite to opaque and carbonate. Euhedral pyroclore (less than 0.25 mm in diameter) is present in opaque minerals. Apatite and barite are also observed a little. composed subhedral which is severely altered, grained euhedral to is altered Siderite ι. Ω occurred like a vein. The specimen medium to coarse hematite.





Sample No. T2607 Sector: Tundulu

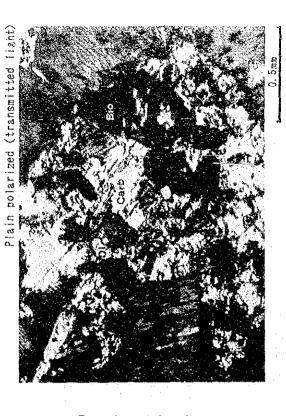
Rock name: Apatite Rock Observation Note:

It is mostly Euhedral pyroclore Euhedral apatite is crystal with wayy extinction. Potassium feldspar is subhedral to carbonate, Opaque mineral Quartz is plugged anhedral apatite, euhedral and is less than 2.5 mm in diameter. quartz, potassium feldspar and opaque mineral. anhedral and is less than 1.2 mm in diameter. altered to hematite, goetite and carbonate. Ψ, O rarely observed (less than 0.25 mm). composed also observed (less than 0.4 mm). is mainly Specimen The Δ w

Sample No. T2611 Sector: Tundulu

Rock name: Biotite rich carbonatite Observation Note:

potassium feldspar, carbonate and opaque mineral. Biotite showing euhedral to subhedral shape is very abundant and the grain size is less feldspar is a subhedral to anhedral crystal of less Opaque mineral is almost decomposed into goetite, mineral than 1.75 mm in grain size, and is mostly altered to chlorite Carbonate is anhedral (less than and carbonate but a small amount of magnetite is Olivine and quartz are rarely observed. biotite, opado diameter) and somtimes displaces mainly composed feldspar, carbonate and opaque mineral, than 1.4 mm in diameter. S.C. The specimen Potassium sericite. hematite nained. E



Plain polarized (transmitted light)

Carb

Sample No. 8Y033 Sector: Chilwa Is.

Rock name: Altered Trachyte

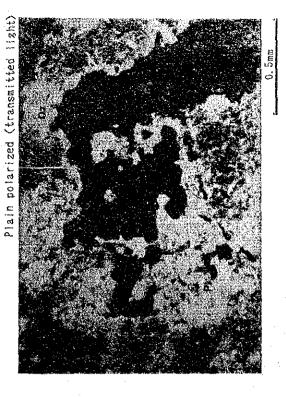
Observation Note:

The specimen may originally show a porphyritic texture, but
the alteration is very severe and the whole rock is altered to
sericite, goetite and hematite. Pseudomorph of feldspar composed
of carbonate and sericite is observed (less than 0.6 mm in diameter).

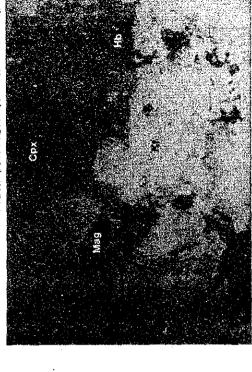
Sample No. 8Y042

Rock name: Syenite Observation Note: Sector: Chilwa

potassium plagioclase Potassium Most crystal diameter) sericite Plagioclase shows anhedral to subhedral and occurs albite twin o less than 0.5 mm in grain size. Quartz is anhedral and distri than 0.7 mm in diameter) and shows green in color. Clinopyroxene is an euhedral to subhedral feldspar is euhedral to subhedral (less than 3.0 mm in The specimen is mainly composed of coarse grained clinopyroxene, 0.1 mm in diameter. and is decomposed into albite and a small amount buted along the margin of clinopyroxene. feldspar and fine to medium grained tite and carbonate are also observed of the crystal forms aggregates, quartz. (less and



Plain polarized (transmitted light)



Both

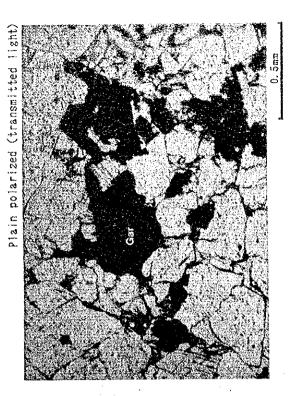
Sector: Chilwa Is. Sample No. 8Y043

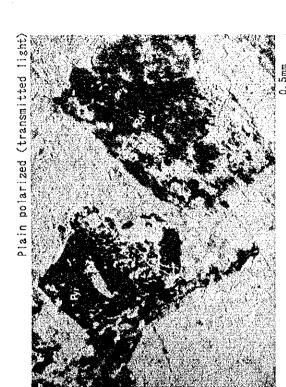
Rock name: Fenitized gneiss Observation Note:

specimen is mainly composed of medium grained potassium Potašsium feldspar is Apatite, titan mineral and magnetite mm), and in particular clinopyroxene and biotite are partly form medium grained Clinopyroxene and biotite are anhedral to subhedral (less than subhedral to anhedral and plagioclase occurs albite twin. with sericte. and fine to diameter. and biotite. anhedral and is less than 1.5 mm in feldspar, plagioclase and quartz, associated clinopyroxene, hornblende to albite respectively are subordinately present are altered aggregates, hornblende in e

Sample No. 8Y057 Sector: Chilwa Is. Rock name: Sovite Observation Note:

in grain dark are subordinately present. Pseudomorphs composed of goetite are observed, which are probably consists of anhedral granular carbonate Anhedral granular quartz which forms aggregates and is 0.2 to 0.5 mm (max 3.5 mm) derived from hornblende or pyroxene, garnet granular The specimen subhedral texture, mosaic size. brown





Sample No. 8Y058 Sector: Chilwa Is.

Rock name: Sovite Observation Note:

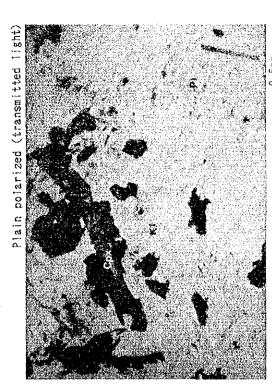
mineral derived from anhedral granular Pyroclore, apatite, quartz, completely altered pyrociore is closely concerned to apatite and magnetite. pyrite and magnetite are subordinately present. Mafic composed texture. pyroxene is observed is mainly carbonate. with mosaic Specimen carbonate goetite biotite

Sample No. 8Y061 Sector: Chilwa Is.

Rock name: Comptonite Observation Note:

The specimen shows a panidiomorphic texture and is mainly composed of clinopyroxene, biotite, magnetite, pyrite and sericite aggregate. Porphyritic mineral which is mostly barite is also observed and is partly altered to chlorite and carbonate. Apatite is partly concentrated.

Plain polarized (transmitted light)



Sample No. 8Y127 Sector: Chilwa Is.

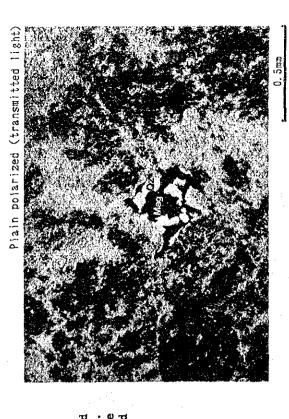
Rock name: Syenite Observation Note:

The specimen is mainly composed of plagioclase, potassium feldspar and clinopyroxene. Plagioclase and potassium feldspar occur a graphic intergrouth. Plagioclase is euhedral and is 3.5 mm in maximum length. Clinopyroxene shows yellowish green to green in color and is euhedral to subhedral (less than 2.0 mm). Magnetite, sphalerite are subordinately present. Secondary sericite and carbonate are also occupied.

Sample No. 8Y145

Sector: Chilwa Is. Rock name: Alkali syenite Observation Note:

The specimen is mostly composed of medium to coarse grained subhedral potassium feldspar which is decomposed into albite. Quartz and magnetite are subordinately present, which are usually associated with togather. Magnetite is partly altered to goetite





Sample No. 8Y147 Sector: Chilwa Is.

Rock name: Sovite Observation Note:

The specimen is mainly composed of anhedral granular carbonate with a mosaic texture. Euhedral to subhedral granular light brown garnet is present and is partly altered to carbonate + epidote + opaque mineral. Clinopyroxene, apatite, magnetite, pyrite and biotite are also observed a little. Clinopyroxene is partly altered to epidote and magnetite is partly decomposed into hematite.

## Appendix 4

X-ray diffractive analysis and charts

Result of X-ray Diffraction Analysis

No. Sample   Sector   Locality   Rock Name   No. Sample   Sector   Locality   Rock Name   No. Sample   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Sector   Locality   Sector   S	r	7.3		T	<del></del>		
Sector   Locality   Rock Mage   Sector   Locality   Rock Mage   Sector   Locality   Rock Mage   Sector   Locality   Rock Mage   C1304   Chilwa Inland   JMC-13 17.70   Anacritic sovite   C2106   Chilwa Inland   JMC-23 33.60   Anacritic sovite   C2106   Chilwa Inland   JMC-23 33.60   Anacritic sovite   C2003   Chilwa Inland   JMC-24 33.60   Anacritic sovite   C2003   Chilwa Inland   JMC-24 33.60   Anacritic sovite   C2003   Chilwa Inland   JMC-24 33.60   Anacritic sovite   C2003   Chilwa Inland   JMC-24 33.60   Anacritic sovite   C2003   Chilwa Inland   JMC-25 33.70   Apartic rock   C2003   Chilwa Inland   Surface   C20003   Chilwa Inland   C20003	ļ	Halite (?)		<b>{</b>			
Sample   Sector   Locality   Rock Name   Calo   C	L	Microlite					
Sample   Sector   Locality   Rock Wame   Rock Wame   Sector   Locality   Rock Wame   Roc	Г	Apatite		6)	<u> </u>		
Sample   Sector   Locality   Rock Name   Calo   C	-		러 러	러디		H	
Sector   Locality   Rock Name   California   Sector   Locality   Rock Name   California   Sector   Locality   Rock Name   California	1	2211230	g-d				
Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   C2208   Chilwa Island   JNC-21 28.4m   Altered sideritic carbonarite   C2208   Chilwa Island   JNC-22 33.8m   Ankeritic carbonarite   C2208   Chilwa Island   JNC-22 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-22 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-23 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-23 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-23 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   JNC-25 33.8m   Ank	-	04130408					
Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   C2208   Chilwa Island   JNC-21 28.4m   Altered sideritic carbonarite   C2208   Chilwa Island   JNC-22 33.8m   Ankeritic carbonarite   C2208   Chilwa Island   JNC-22 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-22 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-23 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-23 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-23 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   JNC-25 33.8m   Ank	L	Pyrochlore					
Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   C2208   Chilwa Island   JNC-21 28.4m   Altered sideritic carbonarite   C2208   Chilwa Island   JNC-22 33.8m   Ankeritic carbonarite   C2208   Chilwa Island   JNC-22 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-22 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-23 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-23 33.8m   Ankeritic carbonarite   C2003   Chilwa Island   JNC-23 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   C2003   JNC-25 33.8m   Ankeritic sovite   JNC-25 33.8m   Ank	L	Goethite	. 7	н н	[ [		
Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   C2106   C01100   L013   L1.	Г	Нешацісь		H			
Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   C2106   C01100   L013   L1.	1	ลาราอบริยม				· H	]
Sector   Locality   Rock Name   Sector   Locality   Rock Name   C200   C30	-	2277(7					
Sector   Locality   Rock Name   Sector   Locality   Rock Name   C200   C30	-	oting					
Sector   Locality   Rock Name   Sector   Locality   Rock Name   C200   C30	L	Pluorite		· · · · · · · · · · · · · · · · · · ·			
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Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Sec	Г	СЫЗОСТСЕ	. 1-4		-		
Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Sec	Г	K-terqabar	7 1				
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Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Locality   Rock Name   Sector   Sec	į	Synchysite				<del>-</del>	
Sample Sector Locality Rock Name (1978)  No. 1304 Chilwa Island JMC-13 17.9m Ankeritic carbonatite (1974)  C2208 Chilwa Island JMC-22 28.4m Altered sideritic carbonatite (2000)  C2208 Chilwa Island JMC-22 33.6m Ankeritic carbonatite (1974)  C2208 Chilwa Island JMC-23 17.3m Ankeritic carbonatite (1974)  C2208 Chilwa Island JMC-29 17.1m Ankeritic carbonatite (1974)  C2000 Chilwa Island JMC-29 17.1m Ankeritic carbonatite (1974)  C2001 Chilwa Island JMC-29 17.1m Ankeritic carbonatite (1974)  C2003 Chilwa Island JMC-29 17.1m Ankeritic carbonatite (1974)  C2004 Chilwa Island JMC-29 17.1m Ankeritic sovite (1974)  S1604 Chilwa Island Surface Carbonatite (1974)  S17501 Tundulu Surface Ankeritic sovite (1974)  S17502 Chilwa Island Surface Sovite (1974)  S17503 Chilwa Island Surface Sovite (1974)  S17504 Chilwa Island Surface Sovite (1974)  S17505 Chilwa Island Surface Sideritic carbonate (1974)  S17507 Tundulu Surface Sideritic carbonate (1974)  S17507 Tundulu JMT-27 19.3m Carbonatite	٢	91 Lucitorite		10 4	H.		·
Sample Sector Locality Rock Name	r	сятктиатсь	p-1				
Sample         Sector         Locality         Rock Name         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00 <td>۲</td> <td></td> <td></td> <td>2</td> <td>23</td> <td></td> <td>5 - S</td>	۲			2	23		5 - S
Sample   Sector   Locality   Rock Name   Sample   Sector   Locality   Rock Name   Sample   Sector   Locality   Rock Name   Sample   Samp	F						н
Sample   Sector   Locality   Rock Name	L	Siderite					
Sample         Sector         Locality         Rock Name         9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Į.	Knenahorite				···	
Sample Sector Locality Rock Name 19 10 10 10 10 10 10 10 10 10 10 10 10 10	Г	Ankerite	4 4 4	4			
Sample Sector Locality Rock Name 19 10 10 10 10 10 10 10 10 10 10 10 10 10	Ì	ээтшотоп	8	нн	4 11		
Sample         Sector         Locality         Rock Name           0.1304         Chilwa Island         JMC-13         17.9m         Ankertic sovite           0.2208         Chilwa Island         JMC-21         28.4m         Altered sideritic carbonatite           0.2208         Chilwa Island         JMC-23         33.8m         Ankeritic sovite           0.2208         Chilwa Island         JMC-24         35.4m         Sideritic carbonatite           0.2208         Chilwa Island         JMC-29         17.1m         Ankeritic sovite           0.2200         Chilwa Island         JMC-29         17.1m         Ankeritic sovite           0.2200         Chilwa Island         Surface         Sovite           0.2201         Chilwa Island         Surface         Ankeritic sovite           0.2200         Chilwa Island         Surface         Sovite           0.2200         Chilwa Island         Surface         Sovite           0.2200         Chilwa Island         Surface         Sovite           0.2200         Chilwa Island         Surface         Sovite           0.2200         Chilwa Island         Surface         Sovite           0.2200         Chilwa Island         Surface         Sovit	ŀ	במדרדות			ㅋ ㅋ ㅋ ㅋ	2	ന
Sample Sector Locality  C1304 Chilwa Island JMC-22 33.8m  C2106 Chilwa Island JMC-22 33.8m  C2208 Chilwa Island JMC-24 35.4m  C2208 Chilwa Island JMC-28 46.2m  C2810 Chilwa Island JMC-28 17.nm  C2904 Chilwa Island JMC-28 17.nm  C2904 Chilwa Island JMC-29 17.nm  C2904 Chilwa Island JMC-29 17.nm  C2904 Chilwa Island Surface  8Y057 Chilwa Island Surface  8Y058 Chilwa Island Surface  8Y058 Chilwa Island Surface  8Y058 Chilwa Island Surface  8Y058 Chilwa Island Surface  8Y058 Chilwa Island Surface  8Y154 Tundulu Surface  8Y155 Tundulu Surface  8Y157 Tundulu Surface  8Y158 Tundulu JMT-7 19.3m  JMT 7 Tundulu JMT-22 41.6m  JMT 22 Tundulu JMT-22 41.6m  JMT 22 Tundulu JMT-22 41.6m  JMT 22 Tundulu JMT-22 41.6m  JMT 25 Tundulu JMT-26 25.0m	H	ottofel		· · · · · · · · · · · · · · · · · · ·			
Sample         Sector         Local1           No.         Chilwa Island         JMC-13           C1304         Chilwa Island         JMC-21           C2106         Chilwa Island         JMC-22           C2208         Chilwa Island         JMC-24           C2208         Chilwa Island         JMC-24           C2810         Chilwa Island         JMC-26           C2803         Chilwa Island         JMC-27           C2904         Chilwa Island         Surface           S1604         Songwe         JMC-26           C2501         Tundulu         JMT-25           SY057         Chilwa Island         Surface           SY058         Chilwa Island         Surface           SY058         Chilwa Island         Surface           SY058         Chilwa Island         Surface           SY058         Chilwa Island         Surface           SY154         Tundulu         JMT-7           JMT 27         Tundulu         JMT-25           JMT 22         Tundulu         JMT-26           JMT 22         Tundulu         JMT-26		Rock Name	Ankeritic govite Altered sideritic cs Ankeritic govite Sideritic carbonatit Ankeritic carbonatit	Ankeritic sovite Sovite Iron oxide ore Apatite rock Sovite	Carbonatite Ankeritic sovite Ankeritic sovite Sovite	Sideritic carbonate Sideritic carbonate Apatite rock Apatite rock Carbonatite	
Sample No.  1304 C1304 C2106 C2208 C2208 C2408 C2208 C2810 C2810 C2810 C2810 C2810 C2810 C2810 C2810 C2810 C2810 C2810 C2810 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C3003 C		Locality			Surface Surface Surface Surface		
		Sector	Chilwa Island Chilwa Island Chilwa Island Chilwa Island Chilwa Island	Chilwa Island Chilwa Island Songwe Tundulu Chilwa Island	Chilwa Island Chilwa Island Chilwa Island Chilwa Island Chilwa Island	Chilws Island Chilws Island Tundulu Tundulu Tundulu	Tundulu Tundulu
		Sample No.	C1304 C2106 C2208 C2408 C2810	C2904 C3003 S1604 T2501 8Y057	8Y155 8Y026 8Y026 8Y038 8Y058	8Y068 8Y124 8Y153 8Y154 JMT 7	JMT 22 JMT 26
		No.		8 6 01 10 10 10 10 10 10 10 10 10 10 10 10	4 4 3 4 4	16 17 18 19 20	22 22

1: Rare, 2: Poor, 3: Common 4: Abundunt

