

Table A-21 Electron microprobe analyses for chromian spinel in ultramafic rocks

No.	1	2	3	4	5	6	7
Sample No.	1	3	4	5--1	5--1	6	6
M99MZ009R	CORE	RIM	CORE	CORE	RIM	CORE	RIM
Element	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)
SiO2	0.04	0.00	0.00	0.04	0.00	0.00	0.02
TiO2	0.02	0.03	0.00	0.08	0.00	0.00	0.03
Al2O3	18.69	19.66	19.08	18.67	19.13	18.26	17.39
Cr2O3	53.17	52.38	54.03	54.37	53.13	54.73	54.64
FeO	17.94	16.86	16.48	15.93	17.31	16.37	15.94
MnO	0.50	0.75	0.65	0.38	0.48	0.67	0.67
MgO	13.19	13.49	13.59	13.53	13.05	13.28	12.79
CaO	0.01	0.03	0.02	0.00	0.00	0.00	0.01
Na2O	0.00	0.03	0.02	0.02	0.00	0.00	0.06
K2O	0.01	0.00	0.00	0.00	0.02	0.01	0.03
total	103.56	103.23	103.88	103.01	103.11	103.31	101.59
O=	4	4	4	4	4	4	4
Si	0.001	0.000	0.000	0.001	0.000	0.000	0.001
Ti	0.001	0.001	0.000	0.002	0.000	0.000	0.001
Al	0.671	0.703	0.679	0.669	0.688	0.656	0.637
Cr	1.280	1.257	1.290	1.308	1.281	1.319	1.343
Fe	0.457	0.428	0.416	0.405	0.441	0.417	0.414
Mn	0.013	0.019	0.017	0.010	0.012	0.017	0.018
Mg	0.599	0.610	0.612	0.613	0.593	0.603	0.593
Ca	0.000	0.001	0.001	0.000	0.000	0.000	0.000
Na	0.000	0.002	0.001	0.001	0.000	0.000	0.003
K	0.000	0.000	0.000	0.000	0.001	0.000	0.001
total	3.022	3.020	3.016	3.009	3.016	3.013	3.011
Cr#	0.656	0.641	0.655	0.661	0.651	0.668	0.678
Fe3+ sp	0.053	0.038	0.029	0.017	0.033	0.022	0.010
Fe2+ sp	0.404	0.390	0.387	0.388	0.408	0.395	0.404
Fe2O3 wt %	2.298	1.654	1.275	0.764	1.458	0.964	0.436
FeO wt %	15.872	15.374	15.334	15.240	15.995	15.506	15.545

No.	8	9	10	11	12	13
sample No.	3	3	3	5--1	6	6
M99MZ014R	CORE	RIM	RIM	CORE	CORE	RIM
Element	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)
SiO2	0.00	0.00	0.00	0.04	0.00	0.02
TiO2	0.05	0.03	0.01	0.08	0.00	0.03
Al2O3	18.68	19.66	19.15	18.67	18.26	17.39
Cr2O3	55.49	52.38	54.92	54.37	54.73	54.64
FeO	15.31	16.86	15.95	15.93	16.37	15.94
MnO	0.70	0.75	0.48	0.38	0.67	0.67
MgO	13.49	13.49	13.34	13.53	13.28	12.79
CaO	0.00	0.03	0.00	0.00	0.00	0.01
Na2O	0.00	0.03	0.04	0.02	0.00	0.06
K2O	0.00	0.00	0.00	0.00	0.01	0.03
total	103.72	103.23	103.88	103.01	103.31	101.59
O=	4	4	4	4	4	4
Si	0.000	0.000	0.000	0.001	0.000	0.001
Ti	0.001	0.001	0.000	0.002	0.000	0.001
Al	0.665	0.703	0.681	0.669	0.656	0.637
Cr	1.325	1.257	1.309	1.308	1.319	1.343
Fe	0.387	0.428	0.402	0.405	0.417	0.414
Mn	0.018	0.019	0.012	0.010	0.017	0.018
Mg	0.607	0.610	0.599	0.613	0.603	0.593
Ca	0.000	0.001	0.000	0.000	0.000	0.000
Na	0.000	0.002	0.002	0.001	0.000	0.003
K	0.000	0.000	0.000	0.000	0.000	0.001
total	3.004	3.020	3.006	3.009	3.013	3.011
Cr#	0.666	0.641	0.658	0.661	0.668	0.678
Fe3+ sp	0.000	0.038	0.004	0.017	0.022	0.010
Fe2+ sp	0.389	0.390	0.398	0.388	0.395	0.404
Fe2O3 wt %	0.000	1.654	0.176	0.764	0.964	0.436
FeO wt %	15.399	15.374	15.789	15.240	15.506	15.545

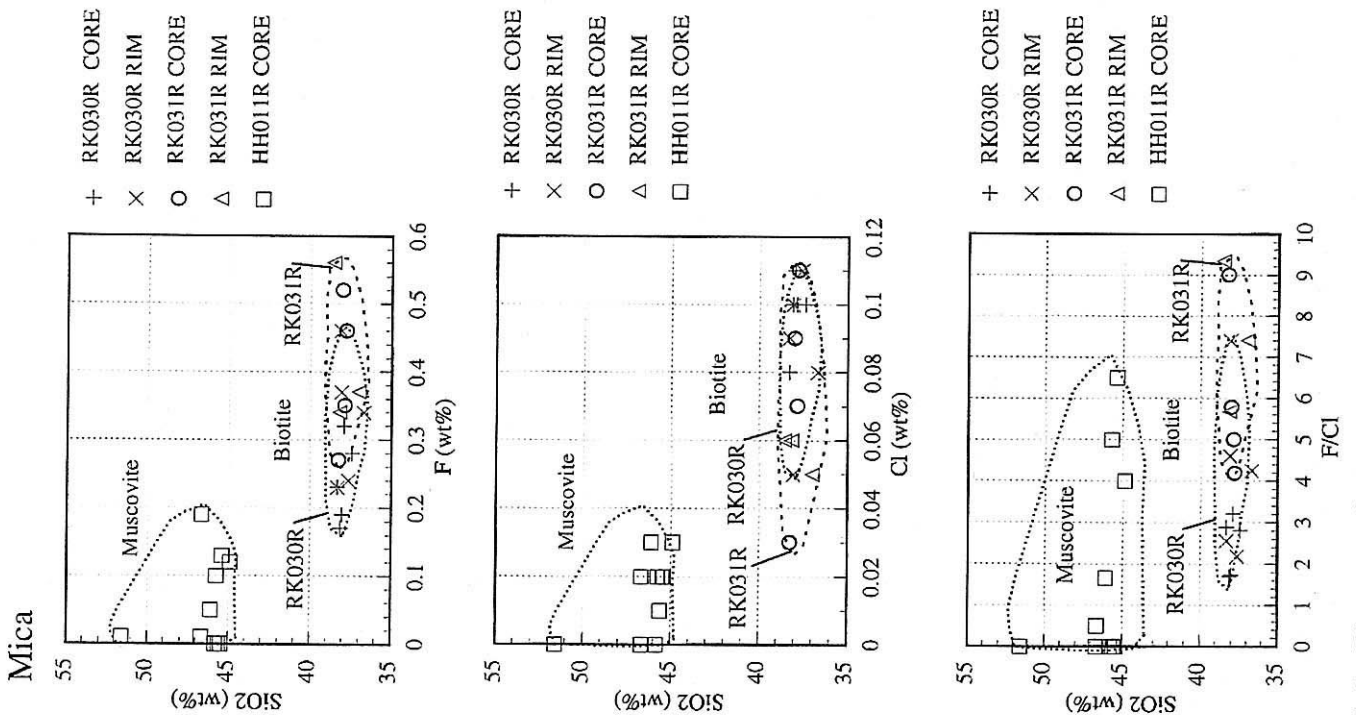


Fig. A-2 Diagrams of Electron microprobe analysis for biotite

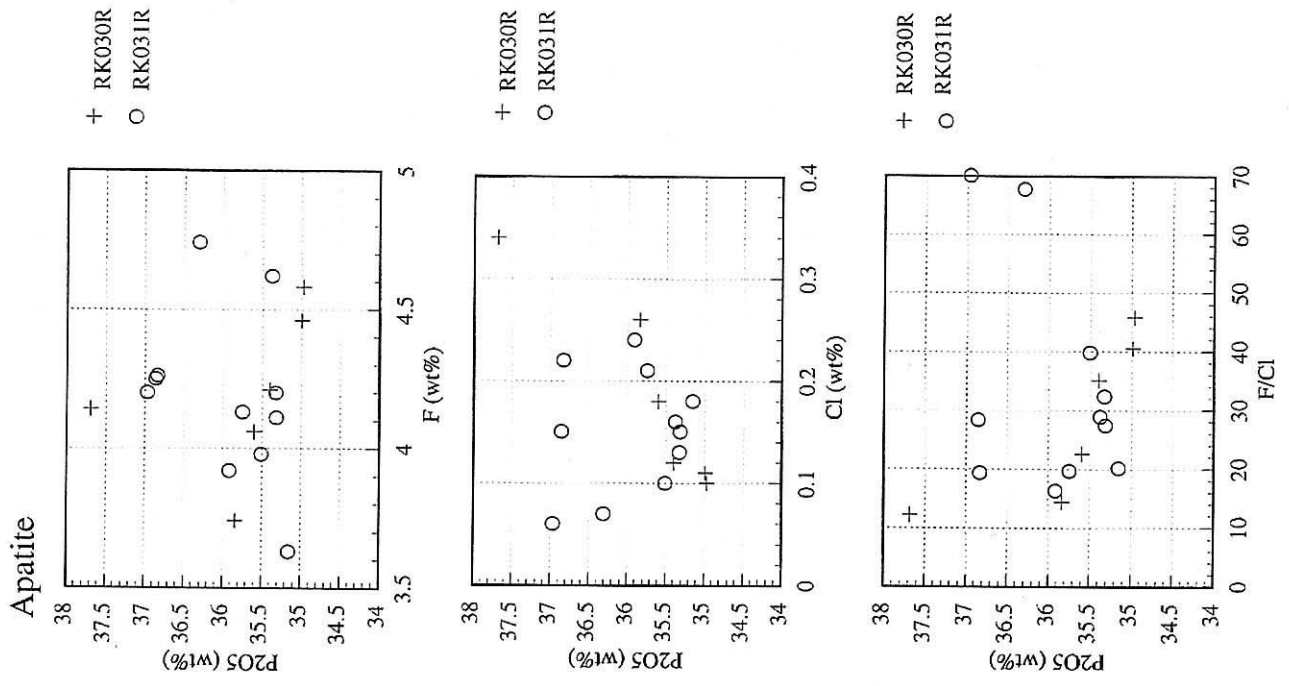


Fig. A-3 Diagrams of Electron microprobe analysis for apatite

Table A-22a Electron microprobe analyses for mica (biotite) in granitic rocks

No.	1	2	3	4	5	6	7	8	9	10
Sample No.	5: RK030R	6: RK030R	7: RK030R	8: RK030R	9: RK030R	10: RK030R	11: RK030R	12: RK030R	16: RK030R	18: RK030R
Element	CORE	RIM	CORE	RIM	CORE	CORE	RIM	RIM	CORE	RIM
	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)
SiO2	38.01	38.11	38.12	37.62	38.32	37.90	38.07	38.30	37.42	36.70
Al2O3	14.30	14.74	14.11	14.17	14.25	13.91	14.47	14.48	13.63	14.01
TiO2	3.74	3.47	3.54	3.21	3.50	3.68	3.41	3.31	4.15	3.54
FeO	15.55	14.87	14.96	14.83	16.21	15.91	16.00	15.53	15.86	16.37
MnO	0.29	0.26	0.34	0.31	0.29	0.29	0.28	0.27	0.23	0.34
MgO	13.78	13.93	14.26	13.87	14.11	13.72	14.05	14.29	14.02	14.19
CaO	0.02	0.00	0.00	0.07	0.06	0.02	0.05	0.04	0.03	0.02
Na2O	0.12	0.09	0.13	0.09	0.14	0.10	0.09	0.12	0.08	0.06
K2O	8.78	8.93	8.72	7.99	8.59	8.73	8.25	8.82	8.95	7.91
P2O5	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.00
Cl	0.11	0.10	0.10	0.11	0.08	0.10	0.05	0.09	0.10	0.08
F	0.19	0.46	0.17	0.24	0.23	0.32	0.37	0.23	0.28	0.34
SO3	0.06	0.03	0.02	0.02	0.02	0.04	0.01	0.02	0.06	0.02
Total	94.95	94.97	94.45	92.51	95.79	94.71	95.10	95.50	94.84	93.59
O=	22	22	22	22	22	22	22	22	22	22
Si	6.222	6.230	6.251	6.273	6.226	6.239	6.216	6.227	6.163	6.117
Al	2.759	2.840	2.727	2.785	2.729	2.699	2.785	2.774	2.646	2.752
Ti	0.461	0.426	0.436	0.402	0.428	0.456	0.418	0.405	0.514	0.444
Fe	2.128	2.033	2.051	2.068	2.202	2.191	2.185	2.112	2.184	2.282
Mn	0.041	0.035	0.047	0.044	0.039	0.040	0.039	0.037	0.032	0.047
Mg	3.363	3.393	3.484	3.448	3.416	3.367	3.419	3.464	3.442	3.527
Ca	0.003	0.000	0.000	0.012	0.011	0.003	0.010	0.007	0.005	0.004
Na	0.037	0.028	0.040	0.029	0.043	0.031	0.027	0.039	0.027	0.020
K	1.834	1.863	1.823	1.699	1.781	1.834	1.719	1.828	1.880	1.682
P	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.003	0.000
Cl	0.032	0.027	0.027	0.032	0.021	0.029	0.014	0.024	0.029	0.023
F	0.099	0.237	0.090	0.124	0.120	0.167	0.193	0.117	0.145	0.178
S	0.007	0.003	0.002	0.003	0.002	0.005	0.001	0.002	0.008	0.003
Total	16.988	17.126	16.989	16.940	17.029	17.070	17.042	17.047	17.099	17.101

No.	11	12	13	14	15	16	17
Sample No.	27: RK031R	28: RK031R	33: RK031R	34: RK031R	37: RK031R	38: RK031R	47: RK031R
Element	CORE	RIM	CORE	RIM	CORE	RIM	CORE
	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)
SiO2	37.81	38.20	37.88	37.03	38.03	38.59	38.26
Al2O3	14.04	14.30	14.40	14.52	14.07	14.64	14.38
TiO2	3.64	3.11	3.59	3.22	4.02	2.97	3.40
FeO	16.52	15.90	16.32	16.96	16.19	16.23	15.36
MnO	0.24	0.13	0.21	0.17	0.24	0.24	0.30
MgO	13.23	14.14	13.45	13.83	13.51	14.11	13.91
CaO	0.07	0.01	0.01	0.01	0.01	0.03	0.03
Na2O	0.11	0.11	0.10	0.10	0.13	0.13	0.11
K2O	8.29	9.09	8.79	7.77	9.24	9.21	8.85
P2O5	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.11	0.06	0.07	0.05	0.09	0.06	0.03
F	0.46	0.34	0.35	0.37	0.52	0.56	0.27
SO3	0.02	0.02	0.00	0.02	0.02	0.04	0.01
Total	94.60	95.40	95.15	94.05	96.04	96.79	94.90
O=	22	22	22	22	22	22	22
Si	6.238	6.237	6.209	6.140	6.209	6.233	6.252
Al	2.730	2.753	2.782	2.837	2.708	2.788	2.769
Ti	0.452	0.383	0.443	0.402	0.493	0.360	0.418
Fe	2.280	2.171	2.237	2.352	2.211	2.193	2.099
Mn	0.033	0.018	0.029	0.023	0.033	0.033	0.042
Mg	3.254	3.442	3.287	3.418	3.287	3.398	3.389
Ca	0.012	0.002	0.002	0.002	0.001	0.005	0.006
Na	0.036	0.033	0.032	0.032	0.039	0.039	0.034
K	1.745	1.895	1.839	1.644	1.924	1.897	1.845
P	0.012	0.000	0.000	0.000	0.000	0.000	0.000
Cl	0.030	0.016	0.019	0.014	0.024	0.017	0.009
F	0.238	0.173	0.181	0.196	0.269	0.284	0.137
S	0.002	0.003	0.000	0.003	0.003	0.004	0.001
Total	17.078	17.143	17.083	17.079	17.210	17.266	17.022

Table A-22b Electron microprobe analyses for mica (muscovite) in granitic rocks

No.	21	22	23	24	25	26	27	28	29	30
Sample No.	79: HH011R	81: HH011R	83: HH011R	84: HH011R	85: HH011R	86: HH011R	87: HH011R	96: HH011R	97: HH011R	02: HH011R
Element	CORE Wt. (%)	CORE Wt. (%)	CORE Wt. (%)	CORE Wt. (%)	CORE Wt. (%)	CORE Wt. (%)	CORE Wt. (%)	CORE Wt. (%)	CORE Wt. (%)	CORE Wt. (%)
SiO ₂	46.68	51.58	44.89	46.10	45.47	45.74	46.68	45.40	45.61	45.81
Al ₂ O ₃	31.19	29.42	31.30	32.14	33.36	33.09	31.46	31.85	32.39	33.82
TiO ₂	0.63	0.09	0.50	0.57	0.68	0.62	0.41	0.61	0.40	0.41
FeO	3.44	1.54	4.24	3.66	3.18	2.92	3.31	3.79	3.65	3.38
MnO	0.00	0.02	0.05	0.00	0.00	0.02	0.03	0.08	0.06	0.00
MgO	1.84	2.24	2.14	1.46	0.79	1.03	1.69	2.00	1.61	0.91
CaO	0.00	0.15	0.00	0.00	0.02	0.00	0.01	0.04	0.01	0.01
Na ₂ O	0.24	0.07	0.34	0.43	0.51	0.37	0.25	0.32	0.35	0.45
K ₂ O	9.89	8.32	9.72	9.47	9.45	9.58	9.51	9.26	9.49	10.01
P ₂ O ₅	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.00	0.00	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.00
F	0.19	0.01	0.12	0.05	0.00	0.10	0.01	0.13	0.00	0.00
SO ₃	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.04	0.04	0.00
Total	94.07	93.63	93.37	93.96	93.59	93.58	93.55	93.56	93.66	94.93
O=	22	22	22	22	22	22	22	22	22	22
Si	6.930	7.470	6.763	6.843	6.759	6.797	6.939	6.782	6.793	6.738
Al	5.458	5.022	5.559	5.624	5.844	5.794	5.512	5.608	5.687	5.862
Ti	0.071	0.010	0.057	0.064	0.076	0.069	0.045	0.069	0.044	0.045
Fe	0.428	0.187	0.534	0.454	0.396	0.363	0.412	0.474	0.454	0.416
Mn	0.000	0.002	0.006	0.000	0.000	0.003	0.003	0.010	0.007	0.000
Mg	0.407	0.484	0.480	0.323	0.176	0.227	0.375	0.445	0.358	0.199
Ca	0.000	0.023	0.000	0.000	0.004	0.000	0.002	0.006	0.002	0.001
Na	0.069	0.021	0.098	0.124	0.148	0.108	0.071	0.091	0.101	0.129
K	1.872	1.537	1.868	1.794	1.793	1.817	1.804	1.765	1.802	1.879
P	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cl	0.000	0.000	0.008	0.008	0.005	0.006	0.005	0.005	0.002	0.000
F	0.088	0.006	0.057	0.022	0.000	0.047	0.004	0.063	0.000	0.000
S	0.000	0.001	0.000	0.000	0.002	0.000	0.000	0.004	0.004	0.000
Total	15.327	14.782	15.445	15.266	15.211	15.245	15.194	15.331	15.261	15.284

Table A-23 Electron microprobe analyses for apatite in granitic rock

No.	1	2	3	4	5	6	7	8	9
Sample No.	1: RK030R CORE	2: RK030R RIM	4: RK030R CORE	14: RK030R in BT RIM	15: RK030R in BT RIM	20: RK030R in BT RIM	29: RK031R in CHL	30: RK031R in CHL	32: RK031R in CHL
Element	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)
SiO2	0.10	0.05	0.15	0.15	0.07	0.15	0.20	0.15	0.23
Al2O3	0.00	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.03
TiO2	0.00	0.07	0.00	0.00	0.00	0.03	0.00	0.01	0.00
FeO	0.18	0.03	0.47	0.19	0.10	0.21	0.09	0.16	0.10
MnO	0.07	0.11	0.06	0.02	0.10	0.08	0.11	0.07	0.09
MgO	0.01	0.03	0.01	0.00	0.01	0.00	0.03	0.01	0.00
CaO	55.14	55.23	54.63	55.23	54.48	55.04	55.05	54.69	54.35
Na2O	0.04	0.02	0.06	0.01	0.09	0.10	0.16	0.10	0.00
K2O	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.01
P2O5	34.99	35.40	34.97	35.60	35.84	37.69	36.84	36.86	36.97
Cl	0.11	0.12	0.10	0.18	0.26	0.34	0.22	0.15	0.06
F	4.46	4.21	4.58	4.06	3.74	4.14	4.26	4.25	4.20
SO3	0.16	0.00	0.13	0.13	0.11	0.23	0.19	0.16	0.10
Total	95.26	95.30	95.16	95.58	94.80	98.02	97.15	96.62	96.14
O=	26	26	26	26	26	26	26	26	26
Si	0.018	0.010	0.026	0.027	0.013	0.026	0.035	0.026	0.040
Al	0.001	0.006	0.000	0.001	0.002	0.001	0.000	0.000	0.007
Ti	0.000	0.009	0.000	0.000	0.000	0.004	0.000	0.001	0.000
Fe	0.026	0.004	0.071	0.028	0.015	0.030	0.014	0.023	0.015
Mn	0.011	0.016	0.009	0.002	0.015	0.012	0.016	0.010	0.013
Mg	0.002	0.008	0.001	0.000	0.001	0.000	0.007	0.003	0.000
Ca	10.584	10.556	10.508	10.488	10.382	10.111	10.246	10.218	10.170
Na	0.013	0.008	0.021	0.005	0.030	0.033	0.054	0.034	0.000
K	0.000	0.001	0.000	0.001	0.001	0.000	0.001	0.003	0.001
P	5.307	5.346	5.314	5.342	5.397	5.471	5.417	5.442	5.467
Cl	0.033	0.036	0.031	0.053	0.079	0.099	0.065	0.046	0.017
F	2.528	2.372	2.600	2.277	2.104	2.246	2.338	2.341	2.318
S	0.022	0.000	0.017	0.017	0.014	0.030	0.025	0.022	0.013
Total	18.545	18.372	18.608	18.258	18.061	18.065	18.219	18.172	18.065

No.	10	11	12	13	14	15	16	17
Sample No.	35: RK031R in BT	40: RK031R in BT RIM	48: RK031R CORE	52: RK031R CORE	56: RK031R CORE	58: RK031R CORE	62: RK031R CORE	70: RK031R in BT RIM
Element	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)	Wt. (%)
SiO2	0.19	0.09	0.16	0.18	0.17	0.19	0.14	0.29
Al2O3	0.00	0.01	0.00	0.01	0.02	0.00	0.00	0.00
TiO2	0.02	0.01	0.03	0.00	0.00	0.02	0.02	0.02
FeO	0.26	0.12	0.10	0.17	0.14	0.02	0.17	0.19
MnO	0.18	0.09	0.14	0.11	0.03	0.07	0.12	0.11
MgO	0.00	0.01	0.00	0.00	0.00	0.03	0.00	0.00
CaO	54.53	55.51	54.71	55.06	54.73	55.33	55.06	54.64
Na2O	0.27	0.01	0.04	0.03	0.16	0.09	0.07	0.11
K2O	0.02	0.00	0.00	0.01	0.01	0.00	0.01	0.02
P2O5	35.16	36.31	35.38	35.32	35.51	35.33	35.92	35.75
Cl	0.18	0.07	0.16	0.15	0.10	0.13	0.24	0.21
F	3.63	4.74	4.62	4.11	3.98	4.20	3.92	4.13
SO3	0.56	0.06	0.06	0.08	0.21	0.24	0.15	0.13
Total	95.02	97.02	95.40	95.22	95.05	95.65	95.79	95.58
O=	26	26	26	26	26	26	26	26
Si	0.034	0.016	0.029	0.032	0.030	0.035	0.024	0.051
Al	0.000	0.002	0.000	0.001	0.003	0.000	0.000	0.000
Ti	0.002	0.001	0.005	0.000	0.000	0.003	0.003	0.002
Fe	0.039	0.018	0.015	0.025	0.021	0.002	0.025	0.028
Mn	0.027	0.013	0.020	0.016	0.004	0.011	0.017	0.016
Mg	0.000	0.002	0.000	0.000	0.001	0.007	0.001	0.000
Ca	10.370	10.426	10.477	10.510	10.426	10.521	10.413	10.367
Na	0.093	0.005	0.014	0.011	0.056	0.032	0.024	0.039
K	0.005	0.000	0.000	0.002	0.001	0.000	0.002	0.004
P	5.283	5.389	5.354	5.328	5.346	5.309	5.367	5.359
Cl	0.055	0.020	0.047	0.045	0.029	0.039	0.070	0.062
F	2.039	2.627	2.614	2.316	2.237	2.355	2.186	2.310
S	0.075	0.008	0.008	0.011	0.028	0.032	0.020	0.017
Total	18.030	18.530	18.586	18.317	18.189	18.345	18.152	18.264

Table A-24 K-Ar radiometric age

Sample	K(wt%)	nL/g	⁴⁰ Ar (radiogenic)	
			%Total	Age (Ma)
M99MZ051R (Biot conc)	1.66	15.2603	73	223 ± 6
M99MZ051R (fsp+qtz conc)	2.66	22.0850	56	202 ± 4

Decay constant ⁴⁰K: $\lambda_{\beta} = 0.4962 \times 10^{-9}$, $\lambda_{e} = 0.581 \times 10^{-10} \text{ yr}^{-1}$.

Isotopic abundance: ⁴⁰K/K = 0.01167% (atomic).

Errors are 2 standard deviations.

Biot conc sample has an error of 2.7%. The analyst suspects that the error is slightly larger in this sample because of some chlorite contaminant within the the biotite.

Sample(Bulk)	K(wt%)	nL/g	⁴⁰ Ar (radiogenic)	
			%Total	Age (Ma)
M99NK041	1.80	15.5539	49	210 ± 4
M99NK052	2.36	27.9509	65	282 ± 6
M99NK067	2.35	18.7434	50	195 ± 4
M99NK083	2.17	18.3144	43	205 ± 4

Decay constants ⁴⁰K: $\lambda_{\beta} = 0.4962 \times 10^{-9}$, $\lambda_{e} = 0.581 \times 10^{-10} \text{ yr}^{-1}$.

Isotopic abundance: ⁴⁰K/K = 0.01167% (atomic).

Errors are 2 standard deviations.

Table A-25 Calculation of $\delta^{18}\text{O}$ water based on the isotopic data and fluid inclusion data

Sample	Area	Type	$\delta^{18}\text{O}(\text{‰})\text{qz}$	Range T°C	Average T°C	$\delta^{18}\text{O}(\text{‰})\text{qz-water}$	$\delta^{18}\text{O}(\text{‰})\text{water}$	NaCl (wt%)
M99NK003M	Zaamar	quartz vein	15.1	136~184	158.2	14.7	0.4	3.60
M99NK003M	Zaamar	quartz vein	15.3	136~184	158.2	14.7	0.6	3.60
M99NK003M	Zaamar	quartz vein	16.2	136~184	158.2	14.7	1.5	3.60
M99NK003M	Zaamar	quartz vein	16.6	136~184	158.2	14.7	1.9	3.60
M99NK005M	Zaamar	quartz vein	18.6	109~151	127.2	17.5	1.1	2.51
M99NK005M	Zaamar	quartz vein	18.6	109~151	127.2	17.5	1.1	2.51
M99NK005M	Zaamar	quartz vein	18.7	109~151	127.2	17.5	1.2	2.51
M99NK005M	Zaamar	quartz vein	18.7	109~151	127.2	17.5	1.2	2.51
M99MZ008M	Altgana Gol	quartz vein	7.6	142~206	183.0	12.8	-5.2	9.34
M99MZ008M	Altgana Gol	quartz vein	7.9	142~206	183.0	12.8	-4.9	9.34
M99MZ008M	Altgana Gol	quartz vein	8.4	142~206	183.0	12.8	-4.4	9.34
M99MZ016M	Erdenet NW	quartz vein	4.3	132~172	151.2	15.3	-11.0	1.97
M99MZ016M	Erdenet NW	quartz vein	4.9	132~172	151.2	15.3	-10.4	1.97
M99MZ016M	Erdenet NW	quartz vein	5.5	132~172	151.2	15.3	-9.8	1.97
M99MZ016M	Erdenet NW	quartz vein	5.9	132~172	151.2	15.3	-9.4	1.97
M99MZ065M	Tsookher Mert	quartz vein	3.0	145~195	169.3	13.8	-10.8	0.16
M99MZ065M	Tsookher Mert	quartz vein	4.5	145~195	169.3	13.8	-9.3	0.16
M99MZ065M	Tsookher Mert	quartz vein	5.8	145~195	169.3	13.8	-8.0	0.16

$\delta^{18}\text{O}(\text{‰})\text{qz-water}$: Oxygen isotopic fractionation factor between quartz and water (Matsuhisa et al., 1979).

$\delta^{18}\text{O}(\text{‰})$ values of muscovite in quartz vein of M99NK003M are +11.8‰ to +11.9‰, calculated temperature by oxygen isotopic fractionation factor between quartz and muscovite (Kieffer, 1982) are 144°C to 230°C.

Table A-26 Measurement of $\delta^{34}\text{S}$ for granitic rocks and pyrite

Sample	Area	Type	Mineralization	$\delta^{34}\text{S}(\text{‰})$	S (%)
M99HH008R	Erdenet NW	Selenge Complex	-	7.2	0.005
M99MZ017R	Erdenet NW	Erdenet Complex	+	-1.8	0.17
M99MZ041R	Erdenet SE	Erdenet Complex	+	-4.8	1.25
M99MZ044R	Erdenet SE	Selenge Complex	-	3.3	0.001
M99MZ036R	Under	Selenge Complex	-	4.6	0.01
M99MZ039R	Under	Erdenet Complex	-	3.8	0.001
M99MZ016M	Erdenet NW	Pyrite		-0.7	
M99MZ016M	Erdenet NW	Pyrite		-0.5	
M99MZ016M	Erdenet NW	Pyrite		-0.5	

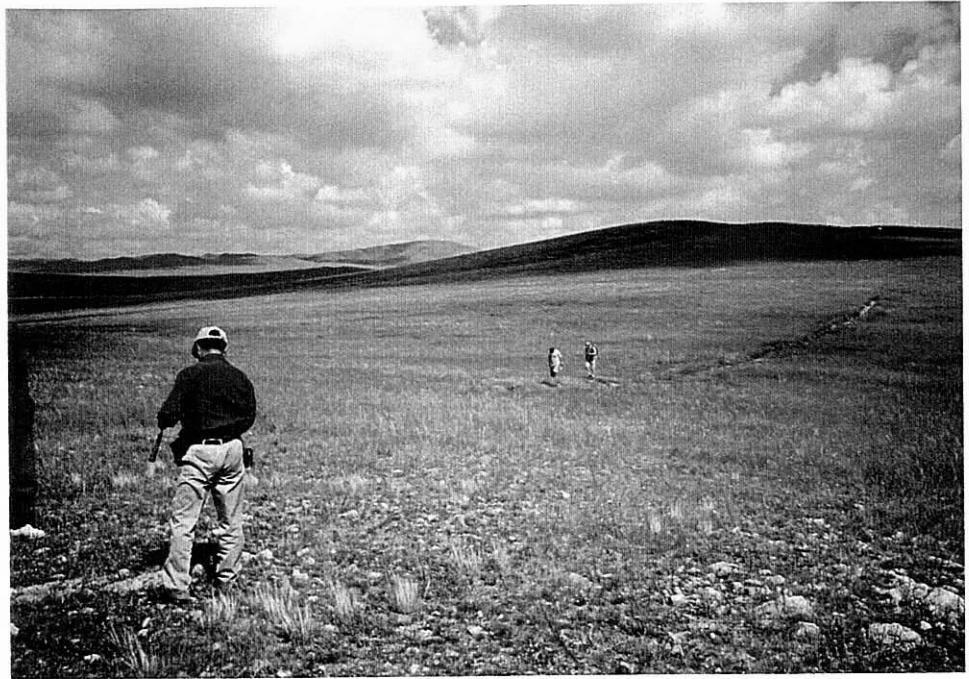


Plate 1
Over view of old trench in No.2 Ulzit oboo prospect, Zaamar district



Plate 2
Old drilling site in No.2 Ulzit oboo prospect, Zaamar district.
Core and rock fragment are scattered.



Plate 3
Old open pit in No.4 Oyuut khonkhor prospect, Bulgan SW district.



Plate 4
Trench in No.4 Oyuut khonkhor prospect, Bulgan SW district.



Plate 5
Panoramic view of No.20a point, Khokhoo district.



Plate 6
Old trench in No.29 Burged khyr prospect, Bulgan West district.

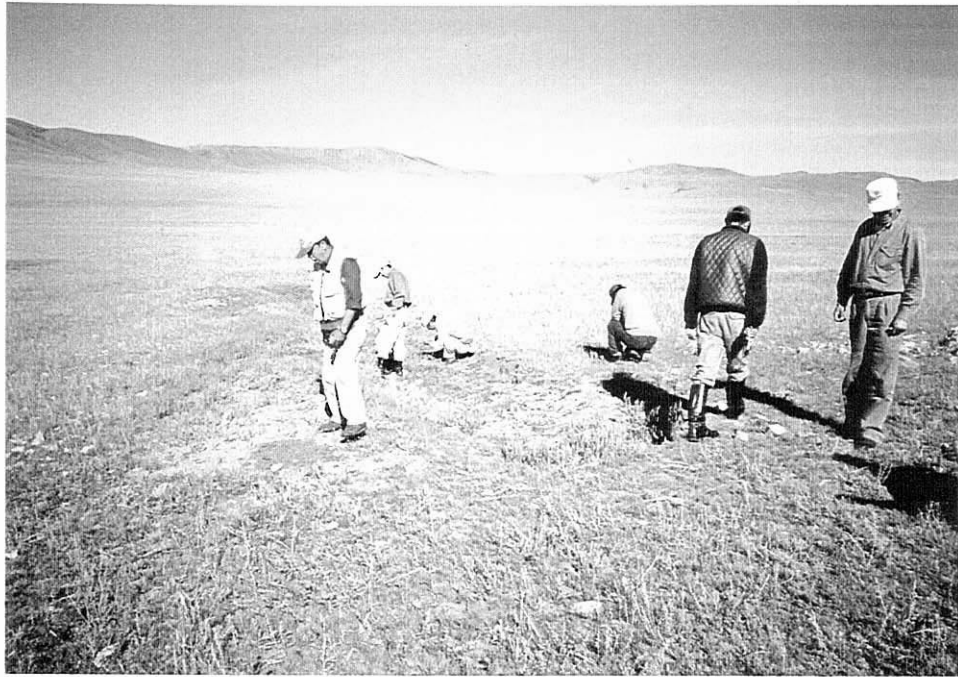


Plate 7
Old trench in No.32 Undrakh prospect, Bulgan West district.



Plate 8
Potassic altered granite with Cu-oxide stain and quartz vein with chalcopyrite in No.32 Undrakh prospect, Bulgan West district.



Plate 9
Over view of No.33 Tsookher mert prospect, Bulgan district.

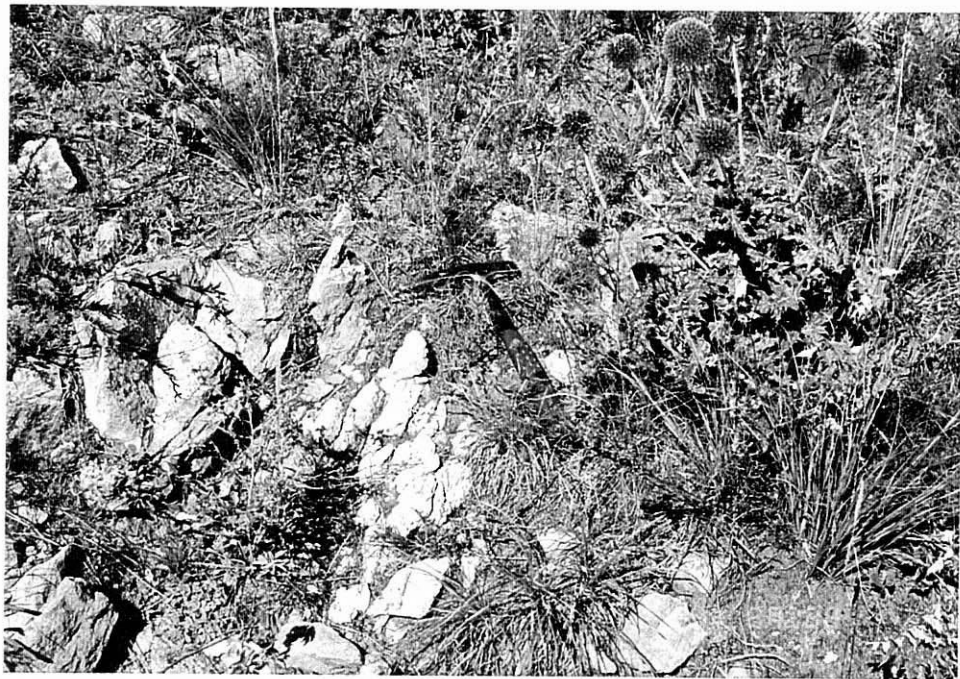


Plate 10
Outcrop of granite with mineralized quartz vein (width: 1-10cm) in No.33 Tsookher mert prospect, Bulgan district.



Plate 11
Outcrop of white silicified volcanic rock in No.36 Talbulag prospect,
Erdenet district.



Plate 12
Over view of No.37 Megein gol prospect, Erdenet district.



Plate 13
Open pit of Erdenet mine (Erdenet NW deposit in Erdenet district).



Plate 14
Weak silicified granite with Cu-oxide in No.41 Erdenet central deposit,
Erdenet district.



Plate 15
Over view of No.42 Tourmaline prospect, Erdenet district.



Plate 16
Fine grain tourmaline disseminates within matrix of brecciated syenogranite
in No.42 Tourmaline prospect, Erdenet district.

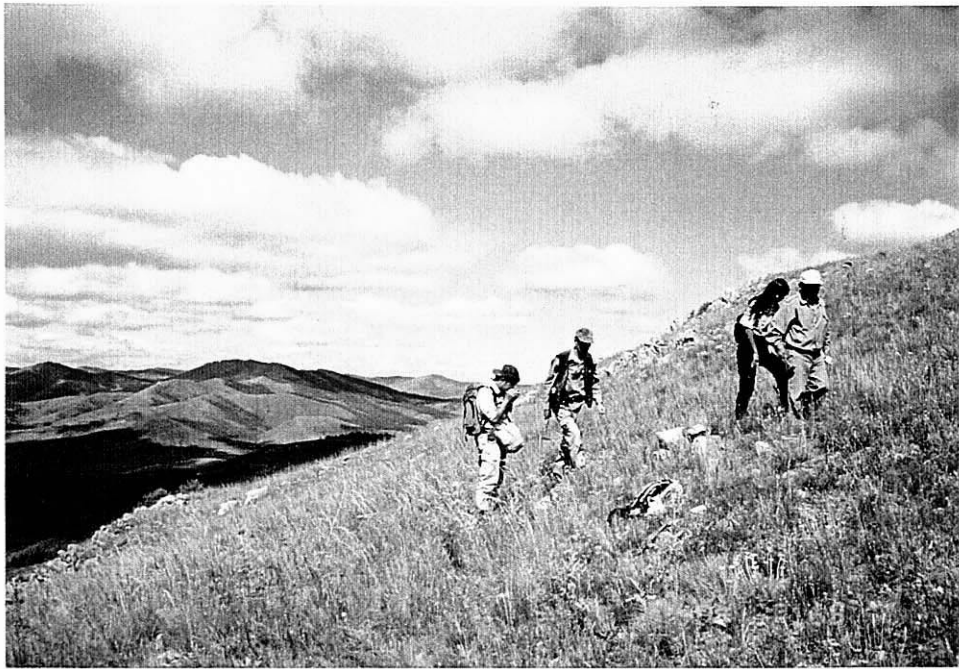


Plate 17

Over view of No.43 Under prospect, Erdenet district.



Plate 18
Outcrop of mineralized granite in No.44 Shand prospect, Erdenet district.



Plate 19
Altered granite with Cu-oxide stain along crack in No.44 Shand prospect,
Erdenet district.

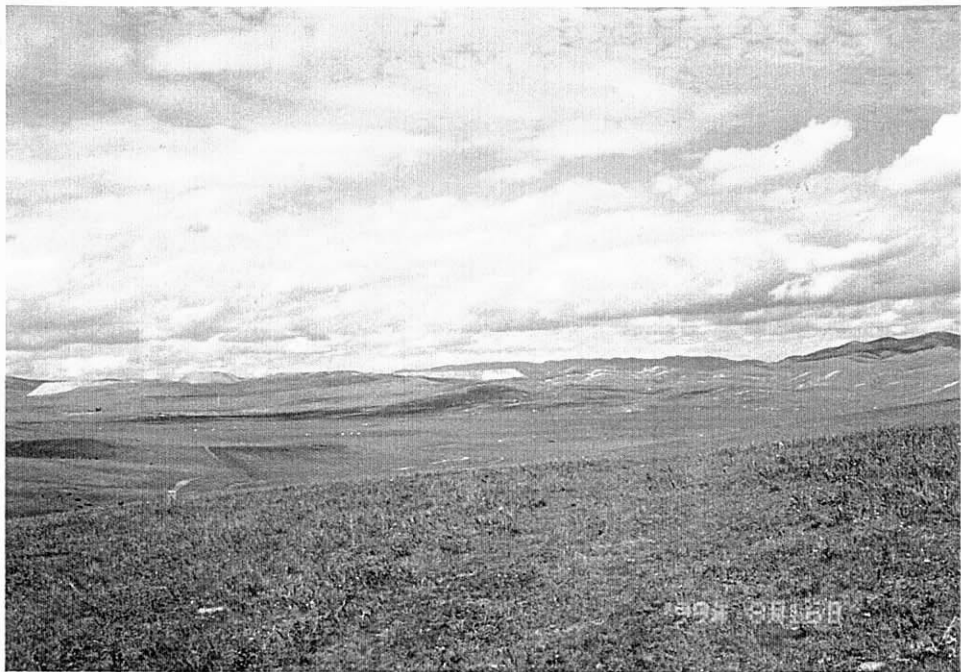


Plate 20

Over view of Erdenet NW deposit, Erdenet central deposit, and Erdenet SE (Oyut) prospect.



Plate 21

Argillized and limonitized rocks in leached zone, No.45 Erdenet SE (Oyut) prospect, Erdenet district.



Plate 22

Silicified dacite with quartz veinlets, torumaline and limonite in No.47
Danbatseren prospect, Erdenet district.



Plate 23
Outcrop of argillized andesite in No.48 Mt. Zain gobaav prospect, Bulgan district.



Plate 24

Propylitic altered andesite with Cu-oxide stain along crack in No.48 Mt. Zain gobaav prospect, Bulgan district.

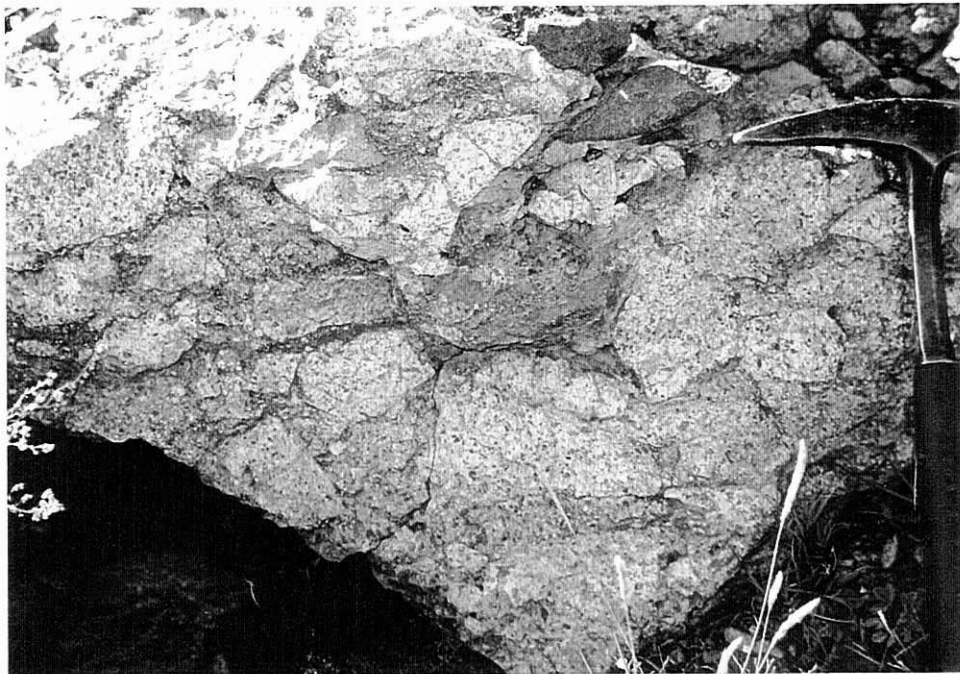


Plate 25

Hydrothermal breccia consist of granodiorite and olivine basalt clasts with minor amount of pulverized matrix in SAR139 point, Erdenet district.



Plate 26
Over view of SAR204 point, Bulgan district.



Plate 27
Epidotized andesite with Cu-oxide along crack in SAR204 point, Bulgan district.

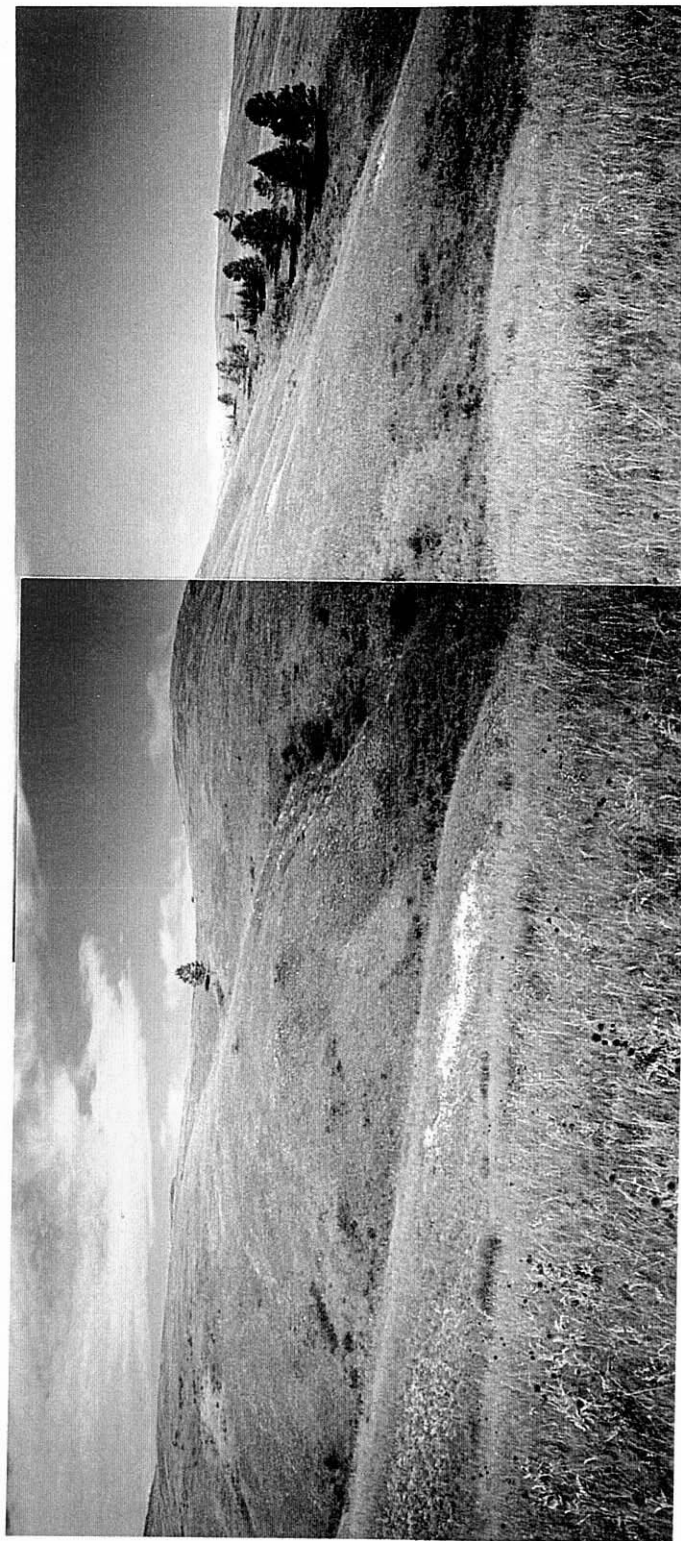


Plate 28
Panoramic view of SAR235 point, Erdenet district.