

Chemistry, Mineralogy, and K-Ar Ages of
Igneous and Metamorphic Rocks of the
Medfra Quadrangle, Alaska

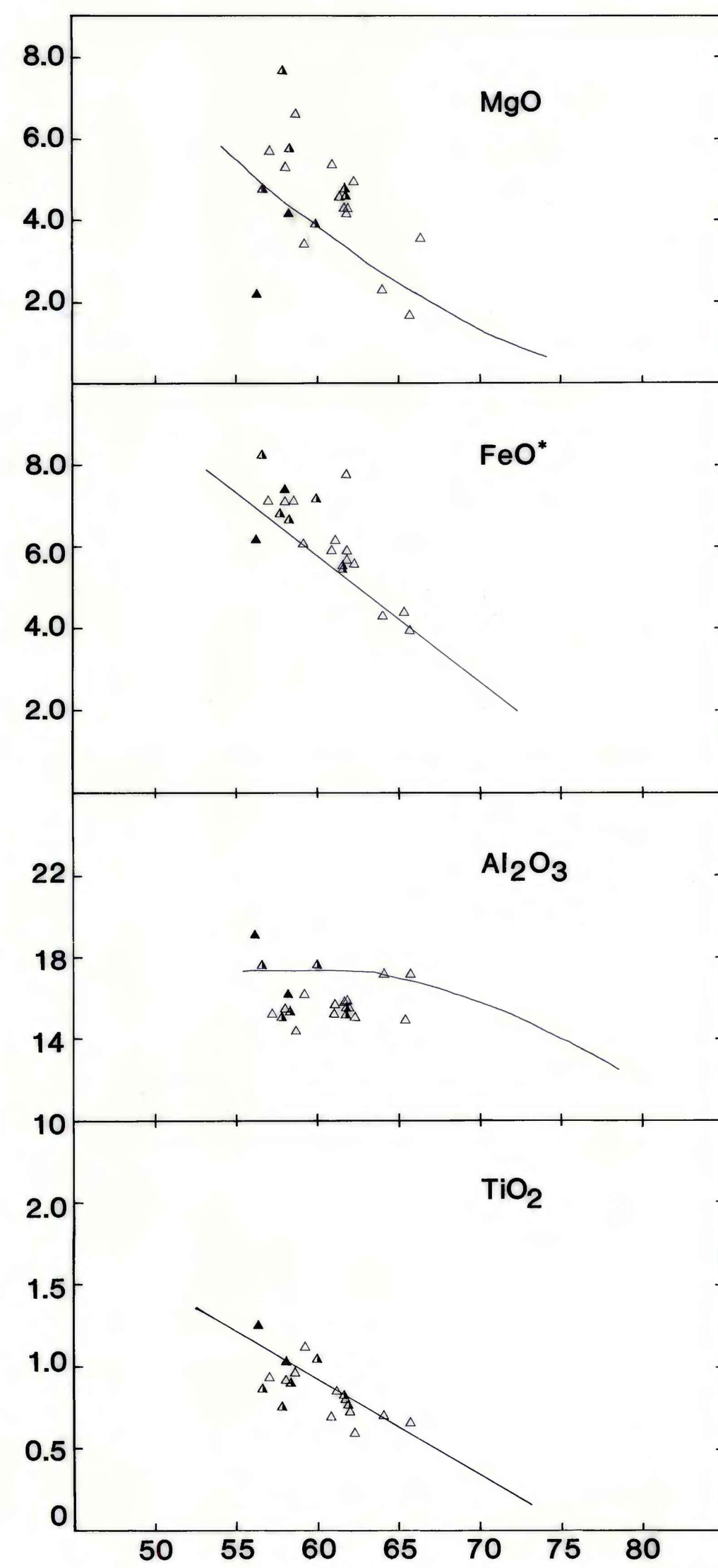


FIGURE I

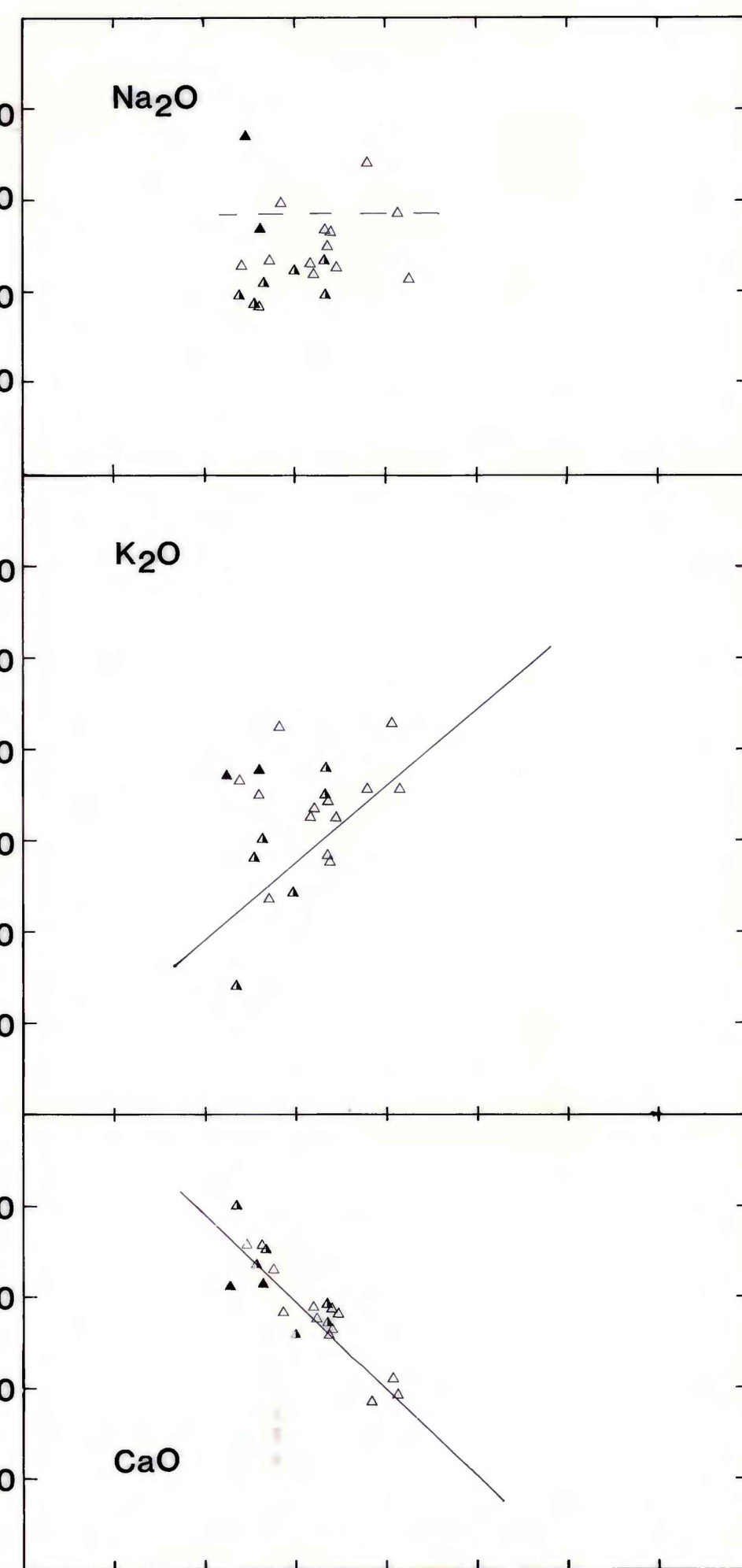


FIGURE II

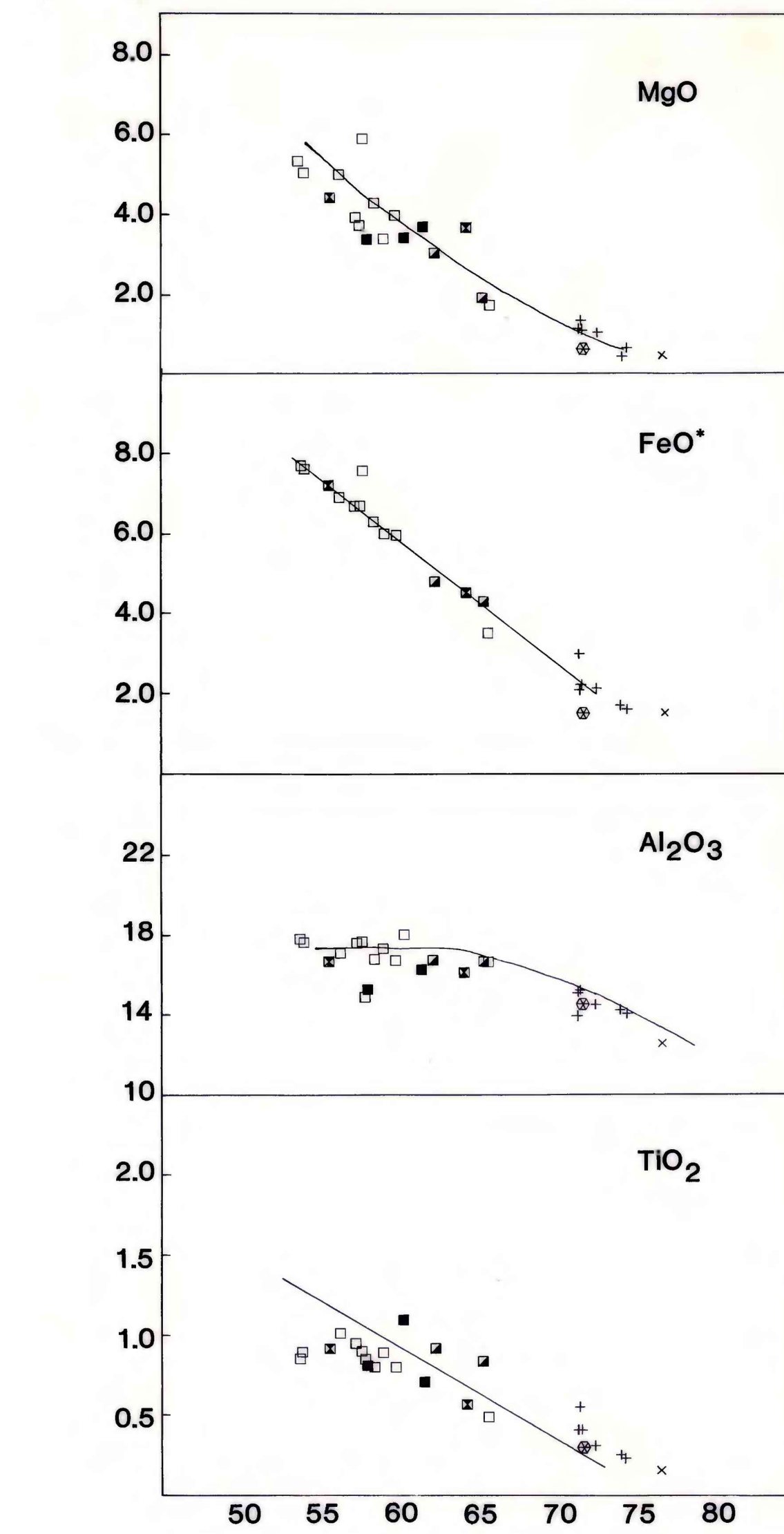
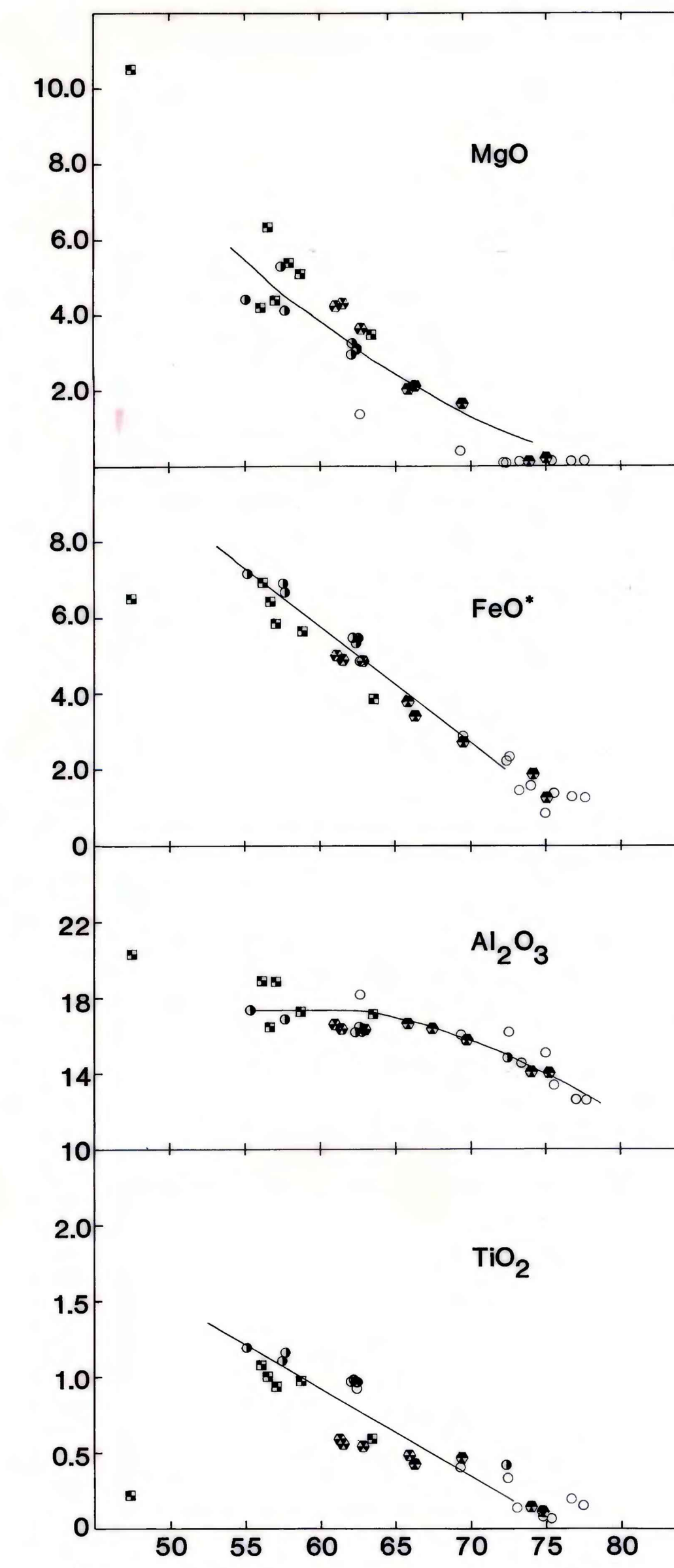


FIGURE III



Figures I, II, III,---Variation of major element oxides with SiO_2 for volcanic and plutonic localities in the Medfra quadrangle. Arbitrary lines are drawn for reference. Figure I shows data from three volcano-plutonic complexes; Figure II shows data from various plutonic bodies; and Figure III shows data from the volcanic units and the plutonic rocks at Stone Mountain. Of the major elements, K_2O at a given SiO_2 content is higher in rocks from Von Frank Mountain and Nixon Fork than in rocks from Stone Mountain and the Nowitna volcanic rocks. Data from the volcano-plutonic complexes (Figure I) show more scatter than data from other areas, probably due to post-depositional alteration.

Table 1.--X-ray fluorescence chemical analyses and CIPW norms of selected volcanic and plutonic rocks

Sample no.	1	2	3	5	6	7	8	9	10	11	13	15	16
Field no.	77Pa77	77Pa203	77Pa78	78Pa132	78Pa149	78Pa62a	78Pa134	78Pa152	78Pa50b	78Pa44d	78Pa25c	78Pa09i	78Pa171b
Latitude	63°52'	63°52'	63°50'	63°21'	63°11'	63°06'	63°22'	63°10'	63°40'	63°34'	63°30'	63°36'	63°27'
Longitude	155°14'	155°14'	155°09'	155°29'	155°59'	155°13'	155°33'	155°58'	154°04'	153°06'	155°01'	154°23'	154°50'
SiO_2	60.76	56.08	71.19	57.86	57.12	56.07	62.59	59.80	71.61	76.44	71.75	60.93	70.35
Al_2O_3	15.92	16.49	14.71	15.77	15.06	14.72	16.75	14.72	14.51	12.55	14.44	16.24	14.96
FeO^*	2.54	3.20	2.25	0.76	1.16	1.59	1.05	1.41	0.38	0.39	0.46	0.80	0.49
FeO	3.08	3.56	0.15	5.26	5.46	4.72	3.24	4.11	1.18	1.19	1.74	4.13	1.80
MgO	2.86	3.90	.01	3.30	5.98	2.13	2.22	4.46	.61	.43	.99	4.23	1.07
CaO	5.45	6.79	1.15	5.50	6.85	6.17	3.65	5.23	2.12	.86	1.95	5.52	2.01
Na_2O	3.43	3.62	3.46	2.90	2.08	3.71	3.34	2.26	2.50	2.37	3.33	3.16	3.47
K_2O	2.52	2.01	5.01	4.14	2.94	3.68	3.48	3.67	6.61	5.26	3.85	2.79	3.81
TiO_2	0.95	1.12	.41	1.10	0.91	1.24	0.69	0.80	.28	.15	.32	.55	.40
P_2O_5	.31	0.38	.07	.68	.35	0.65	.31	.28	.12	.01	.10	.26	.10
MnO	.08	.12	.03	.12	.15	.10	.09	.13	.04	.03	.02	.11	.05
H_2O^+	.41	.39	.66	1.33	1.45	.76	1.35	1.66	.30	.31	.47	.52	.67
H_2O^-	1.20	.94	.96	.39	.47	.11	.40	.78	.10	.16	.19	.23	.18
CO_2	.19	.62	.26	.14	.14	.04	.09	.35	.06	.19	.27	.09	.14
Total	99.70	99.21	100.32	99.25	99.72	100.03	99.25	99.46	100.42	100.35	99.88	99.56	99.69
CIPW norms (weight percent)													
Q	16.70	8.51	30.09	11.59	13.77	3.70	19.81	16.79	26.04	39.45	31.82	15.29	29.24
C	1.70	---	---	---	---	---	1.485	---	---	1.75	2.02	---	1.96
Z	---	---	---	0.045	0.045	0.06	0.03	0.05	0.04	0.04	0.05	0.03	0.03
OR	15.24	12.23	30.08	24.92	17.64	21.68	20.98	22.28	38.83	30.91	22.72	16.58	22.56
AB	29.70	31.55	29.75	24.99	17.87	31.30	28.84	19.65	21.03	19.94	28.14	26.89	29.42
AN	21.08	23.49	5.33	16.115	23.43	24.41	16.80	19.71	8.80	3.25	7.56	22.01	8.67
MS	1.89	3.61	---	.845	2.65	.83	.32	---	.32	---	1.12	---	---
EN	7.29	10.00	0.03	8.37	14.11	5.29	5.64	11.41	1.51	1.07	2.46	10.595	2.67
FD	2.09	3.60	---	---	---	---	---	---	1.45	1.71	2.26	---	2.33
FA	---	---	---	---	---	---	---	---	---	---	---	---	---
MT	3.64	3.91	.40	---	---	2.33	---	---	.55	.58	.68	---	.71
CP	---	---	---	.06	---	.02	---	.045	.02	---	.09	.015	.02
HM	---	---	---	1.67	6.74	7.35	---	---	4.755	6.15	---	---	5.43
IL	1.85	2.19	.79	.26	.31	2.35	.20	.28	.53	.28	.61	.23	.76
RU	---	---	---	---	---	---	.60	---	---	---	---	---	---
AP	.75	.93	.17	1.64	.84	1.54	---	.68	.28	.02	.24	.62	.24
CC	---	---	---	---	---	.09	.75	---	.14	.43	.61	---	.32
TK	---	---	---	2.41	1.87	---	---	1.66	---	---	---	---	---
Total	100.02	100.00	100.00	99.93	99.94	99.04	99.88	99.93	99.52	99.44	99.26	99.88	98.91
Satlic	82.52	75.78	96.95	79.66	72.75	81.16	87.94	76.47	94.74	95.35	92.31	80.805	91.87
Femic	17.50	24.24	3.05	20.27	27.19	17.88	11.94	21.46	4.78	4.09	6.95	19.075	7.04

TKm								TKv				
19	20	21	22	23	24	25	26	27	28	29	30	
78Pa7	77Pa139b	78Pa20	78Pa105f	78Pa104a	78Pa117c	78Pa53a	78Pa151e	78Pa008a	78Pa008	78Pa41b	78Pa137c	
63°33'	63°28'	63°14'	63°32'	63°32'	63°33'	63°43'	63°43'	63°32'	63°39'	63°43'	63°35'	
155°56'	154°19'	154°16'	154°16'	154°20'	154°19'	153°51'	153°51'	154°37'	154°17'	154°24'	154°09'	
54.99	56.98	64.16	53.28	64.44	58.03	55.87	47.07	72.91	64.37	65.08	67.62	
16.56	14.93	15.89	17.51	16.37	17.01	16.37	20.29	13.96	16.30	16.12	15.40	
1.43	1.12	0.96	1.30	0.94	1.22	1.00	1.35	0.70	0.54	0.93	0.77	
5.85	5.70	3.36	6.32	2.62	4.83	5.44	5.29	1.21	3.21	2.52	1.95	
4.32	5.24	1.81	4.93	1.63	3.33	6.22	10.27	.07	2.02	1.96	1.51	
6.37	6.84	3.21	7.13	3.48	5.11	7.34	12.38	1.36	3.98	3.72	2.82	
3.70	3.09	3.48	3.49	3.66	3.25	3.48	1.86	3.38	2.90	3.56	3.14	
3.67	2.89	4.27	3.07	4.06	4.08	1.47	.17	4.59	3.42	3.25	3.30	
.91	.80	.83	.87	.47	.87	.99	.22	.13	.48	.40	.45	
.61	.33	.23	.38	.20	.38	.19	.03	.08	.18	.17	.12	
.15	.13	.07	.14	.07	.05	.11	.11	.04	.04	.10	.10	
.50	.95	.61	.38	1.11	.93	.31	.68	.71	1.53	1.48	1.37	
.11	.14	.18	.12	.20	.25	.19	.21	.11	.16	.37	.16	
.04	.05	.07	.13	.07	.11	.03	.33	.69	.80	.05	1.34	
99.20	99.19	99.15	99.05	99.32	99.45	99.02	100.26	99.94	99.93	99.71	100.08	
CIPW norms (weight percent)												
---	5.50	16.81	---	16.81	6.43	4.33	---	37.65	23.70	19.91	31.25	
---	---	0.21	---	0.12	---	---	---	1.02	0.92	0.34	4.92	
0.08	0.05	.075	0.03	.06	0.06	0.03	---	0.03	.05	.045	0.03	
21.78	17.17	25.54	18.25	24.09	24.17	8.76	1.00	25.66	20.62	19.20	19.48	
31.44	26.28	29.80	29.70	31.09	27.56	29.69	15.69	27.06	25.04	30.12	26.54	
17.82	16.43	14.74	23.18	16.00	19.82	24.91	46.36	6.08	19.28	17.48	4.73	
4.24	5.64	---	4.02	1.19	4.38	5.26	---	---	---	---	---	
9.37	13.12	4.56	7.24	4.08	8.31	15.62	6.52	.165	5.13	4.88	3.86	
7.25	8.46	---	5.51	3.39	6.51	7.77	2.82	---	---	---	---	
1.01	---	---	3.58	---	---	---	11.89	---	---	---	---	
.86	---	---	3.00	---	---	---	4.33	---	---	---	---	
2.11	1.66	---	1.93	1.38	1.80	1.49	1.98	---	---	1.36	1.13	
.02	.09	.015	.03	.02	.02	.07	.02	---	---	.02	.015	
---	---	4.76	---	---	---	---	---	1.94	4.19	---	---	
1.74	1.53	.14	1.66	.90	1.66	1.90	.42	.08	.09	.76	.85	
---	.77	---	---	---	---	---	---	.08	.44	---	---	
1.45	.79	.55	.91	.48	.90	.45	.07	.18	.435	.40	.28	
.09	.11	---	.30	.16	.25	.07	.75	---	---	.11	3.04	
99.25	98.81	99.96	99.33	98.55	98.68	99.46	99.11	99.94	99.89	98.00	98.48	
71.11	67.42	88.17	71.16	88.16	78.04	67.71	63.05	97.49	89.60	87.10	86.95	
28.14	31.39	10.79	28.17	10.39	20.64	31.75	36.06	2.45	10.29	10.90	11.53	

TKs					TKg	
33	34	35	36	38		
78Pa36a	77Pa202	77Pa201	78Pa17b	78Pa24b		
63°52'	63°51'	63°50'	63°59'	63°42'		
153°03'	153°13'	153°12'	155°08'	155°48'		
72.17	70.70	67.38	50.93	50.30		
14.60	15.50	15.78	15.35	15.80		
1.49	2.30	1.97	1.85	4.42		
0.06	0.22	1.00	8.75	7.28		
0.08	0.05	0.37	4.98	5.37		
7.09	3.43	2.53	4.86	10.50		
4.05	1.42	2.95	3.95	1.60		
5.29	6.66	4.67	0.67	0.57		
-.13	-.31	-.38	1.53	1.76		
-.03	-.12	-.16	-.18	-.20		
-.01	-.01	-.01	-.20	-.21		
-.47	2.10	1.57	1.89	1.48		
-.06	0.05	0.60	-.30	1.10		
-.92	153.00	100.85	99.36	99.51		
CLIPs norms (weight percent)						
26.88	27.61	27.60	---	---	6.40	
0.99	5.76	1.70	---	---	---	
-.09	---	---	0.03	---	---	
31.39	40.33	28.39	5.17	3.39	---	
34.41	12.31	25.89	33.60	13.63	---	
3.36	0.93	11.84	21.70	34.47	---	
2.20	---	---	9.27	13.29	---	
2.30	-.13	0.95	2.70	3.27	---	
---	---	---	2.46	---	---	
---	---	---	9.24	14.10	---	
---	---	---	2.24	---	---	
---	---	---	2.46	---	---	
---	1.29	2.55	2.74	3.30	---	
-.02	---	---	-.03	---	---	
1.50	.96	.18	---	---	---	
-.12	.60	.74	2.92	1.45	---	
-.07	---	---	---	---	---	
-.07	.29	.39	-.43	-.48	---	
-.14	---	---	---	-.41	-.28	
99.22	100.01	100.01	97.84	97.42		
97.11	96.73	99.20	60.49	57.91		
2.11	3.28	4.81	37.35	39.50		