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**Title of article** Geochemistry and plate-tectonic significance of the  
volcanic rocks of the Summerford Group, north-central Newfoundland

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see Geology v. 13, p. 126 - 130

**Contents** 7 pages

Table 1 and Figs 2, 3, 4, 5, 7, and 9

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TABLE 1A. MAJOR ELEMENT ABUNDANCES OF VOLCANIC ROCKS IN SUMMERFORD GROUP

	1	2	3	4	5	6	7	8	9	10	11
SiO <sub>2</sub>	44.09	43.92	44.51	50.38	42.21	47.97	47.30	47.89	49.21	44.94	43.40
Al <sub>2</sub> O <sub>3</sub>	19.22	19.96	18.80	18.45	17.82	16.63	18.07	16.18	17.03	16.53	17.97
FeO*	15.91	14.86	14.91	13.06	12.94	15.32	12.84	14.37	11.77	11.21	13.47
MgO	5.09	4.33	2.72	2.28	3.96	3.28	5.86	5.05	5.10	6.06	8.07
CaO	5.10	4.89	7.68	6.03	11.05	5.19	5.10	7.46	6.14	7.31	6.97
Na <sub>2</sub> O	2.99	3.17	3.68	3.82	2.75	3.72	3.72	3.23	5.10	5.10	2.85
K <sub>2</sub> O	0.32	0.86	1.68	1.50	0.20	0.69	0.60	0.21	0.24	0.10	0.48
P <sub>2</sub> O <sub>5</sub>	0.36	0.39	0.43	0.38	0.72	0.58	0.26	0.52	0.45	0.19	0.21
TiO <sub>2</sub>	1.69	1.72	1.68	1.71	2.73	1.65	1.65	1.67	1.80	1.54	1.69
MnO	0.08	0.11	0.16	0.09	0.18	0.11	0.11	0.12	0.18	0.18	0.20
L.O.I.	6.22	6.96	4.72	3.09	6.32	6.08	4.38	4.14	2.87	7.29	5.36
Total	101.07	101.17	100.97	100.79	100.88	101.22	99.89	100.84	99.89	100.45	100.67
FeO*/MgO	3.12	3.43	5.48	5.73	3.27	4.67	2.19	2.84	2.31	1.85	1.67
Na <sub>2</sub> O+K <sub>2</sub> O	3.31	5.03	5.36	5.32	2.95	4.41	4.32	3.44	5.34	5.20	3.33
Zr/P <sub>2</sub> O <sub>5</sub>	0.049	0.045	0.046	0.052	0.031	0.030	0.071	0.038	0.054	0.088	0.077

Note: SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, FeO\*, P<sub>2</sub>O<sub>5</sub>, TiO<sub>2</sub> by atomic absorption spectroscopy; MgO, CaO, Na<sub>2</sub>O, K<sub>2</sub>O, MnO by spectrophotometry. L.O.I. = loss on ignition, FeO\* = total iron

TABLE 1B. TRACE ELEMENT ABUNDANCES OF VOLCANIC ROCKS IN SUMMERFORD GROUP

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Zr	166	165	187	186	215	164	174	186	236	156	151	121	138	88	210	174	200
Y	22	28	32	35	45	35	29	28	39	27	31	28	26	22	22	25	36
Sr	226	182	349	372	397	233	335	515	1084	695	286	-	-	-	-	-	-
Cr	255	253	107	117	326	150	201	282	178	160	398	110	630	135	215	199	169
Ni	87	98	38	51	119	70	78	129	48	126	169	-	-	-	-	-	-
Ti*	-	-	-	-	-	-	-	-	-	-	-	7850	9350	8150	10	490	12
															330	9170	

Note: Values are parts per million, determined by x-ray fluorescence

\* Concentrations of samples 1-11 determined spectrophotometrically; see Table 1A.

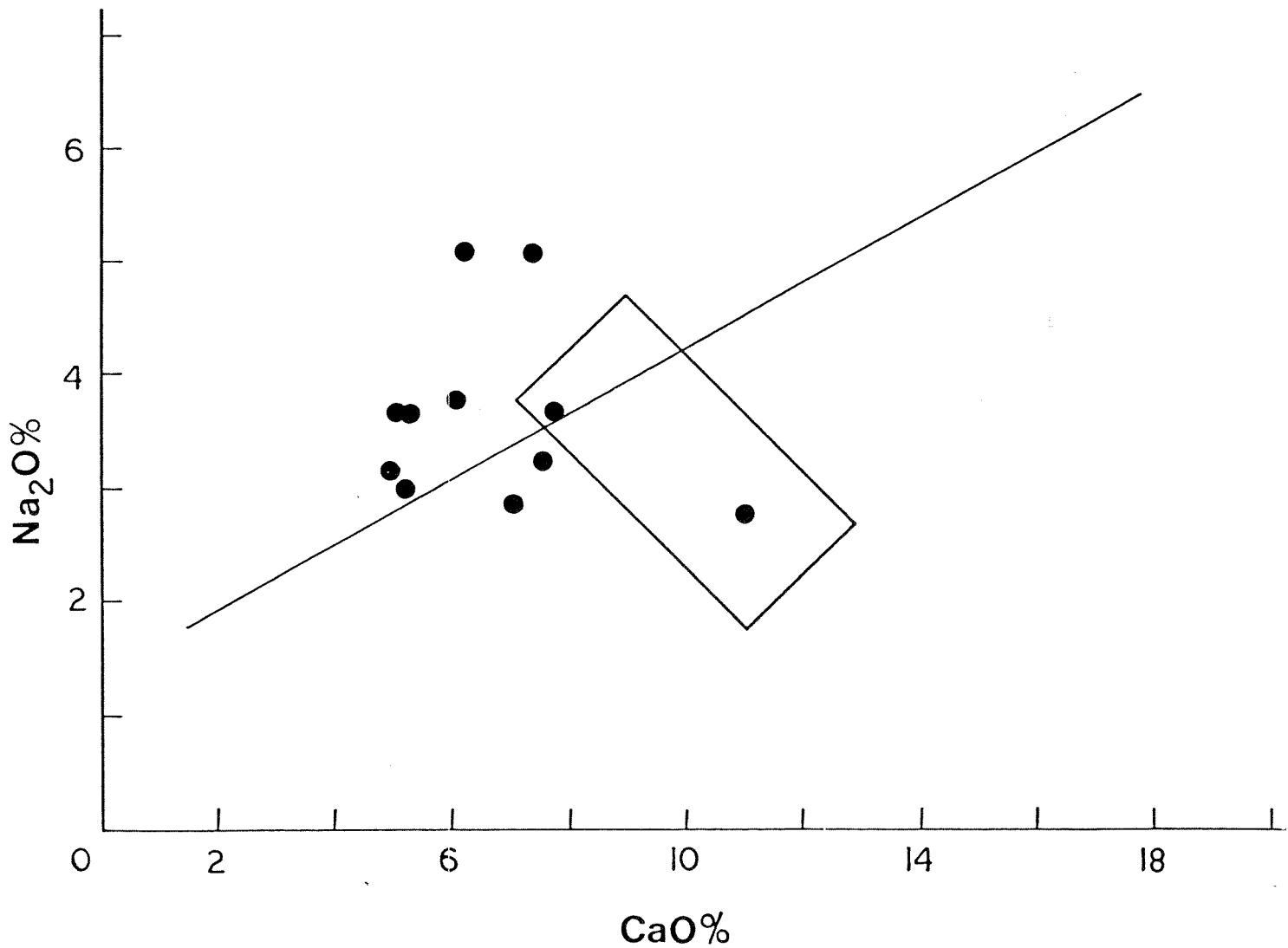


Figure 2. Na-Ca diagram showing alteration effects of basalts in Summerford Group. Diagonal line divides soda-rich spilites from normal basalts (after Graham, 1976; Stillman and Williams, 1978). Rectangle represents field of normal, unaltered basalts (after Stillman and Williams, 1978).

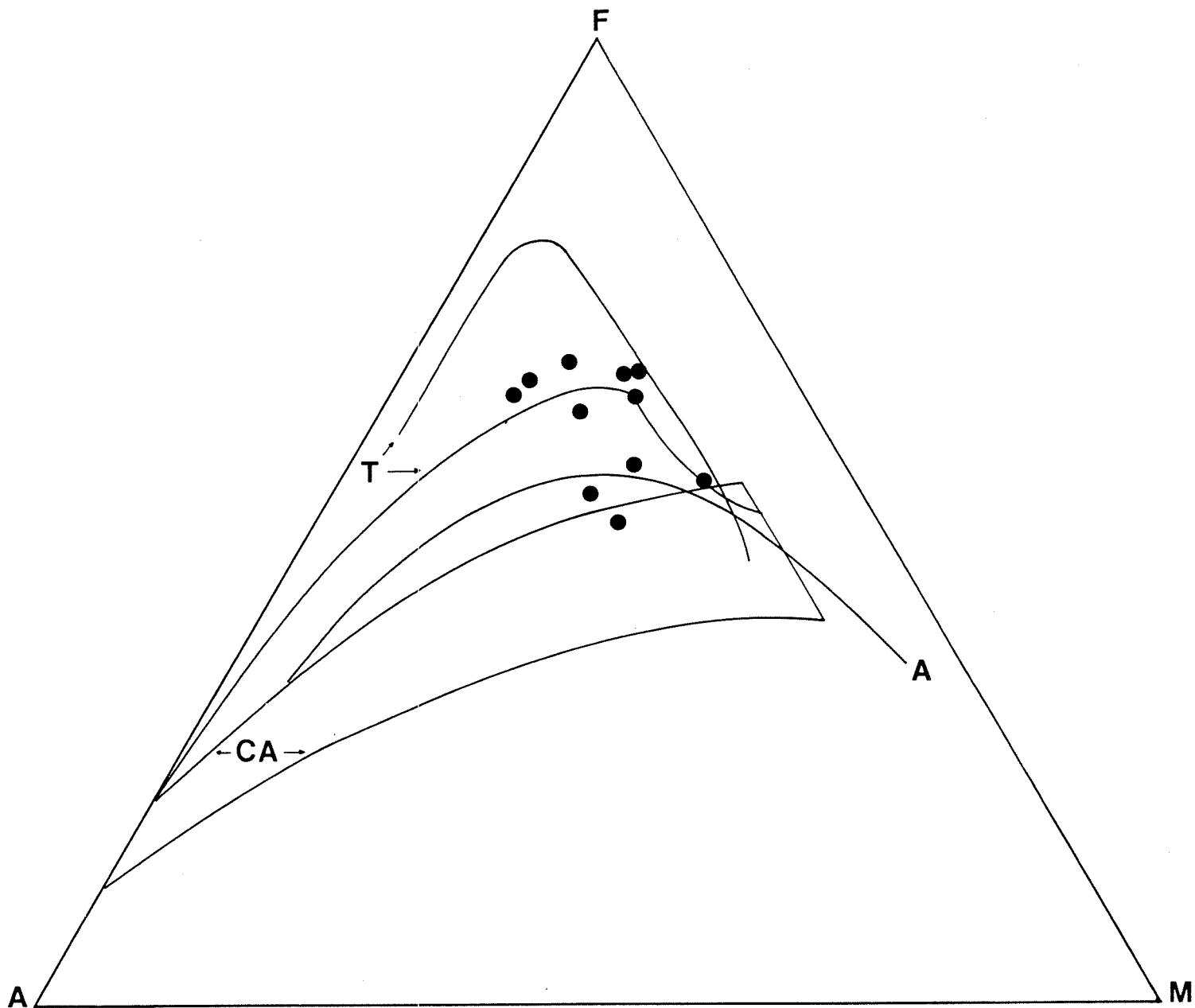


Figure 3. AFM diagram showing composition trends of volcanic rocks in the Summerford Group compared to various differentiation trends. Tholeiitic (T) and calc-alkaline (CA) trends from Ringwood (1974); alkaline (A) trend of Hawaii basalts from Strong (1974).

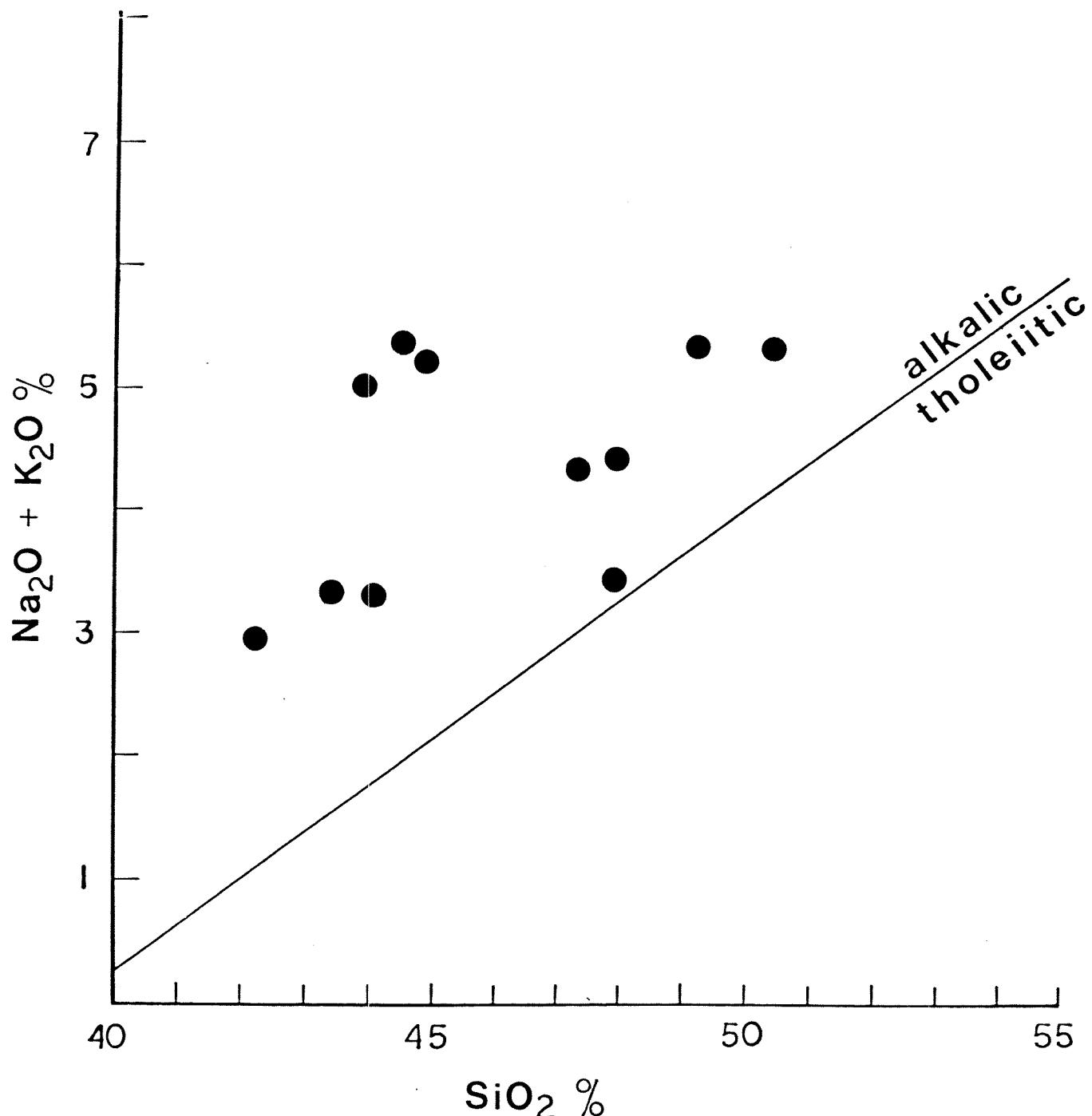


Figure 4. Alkali-silica diagram with volcanic rocks in Summerford Group compared to alkalic-tholeiitic boundary of MacDonald and Katsura (1964).

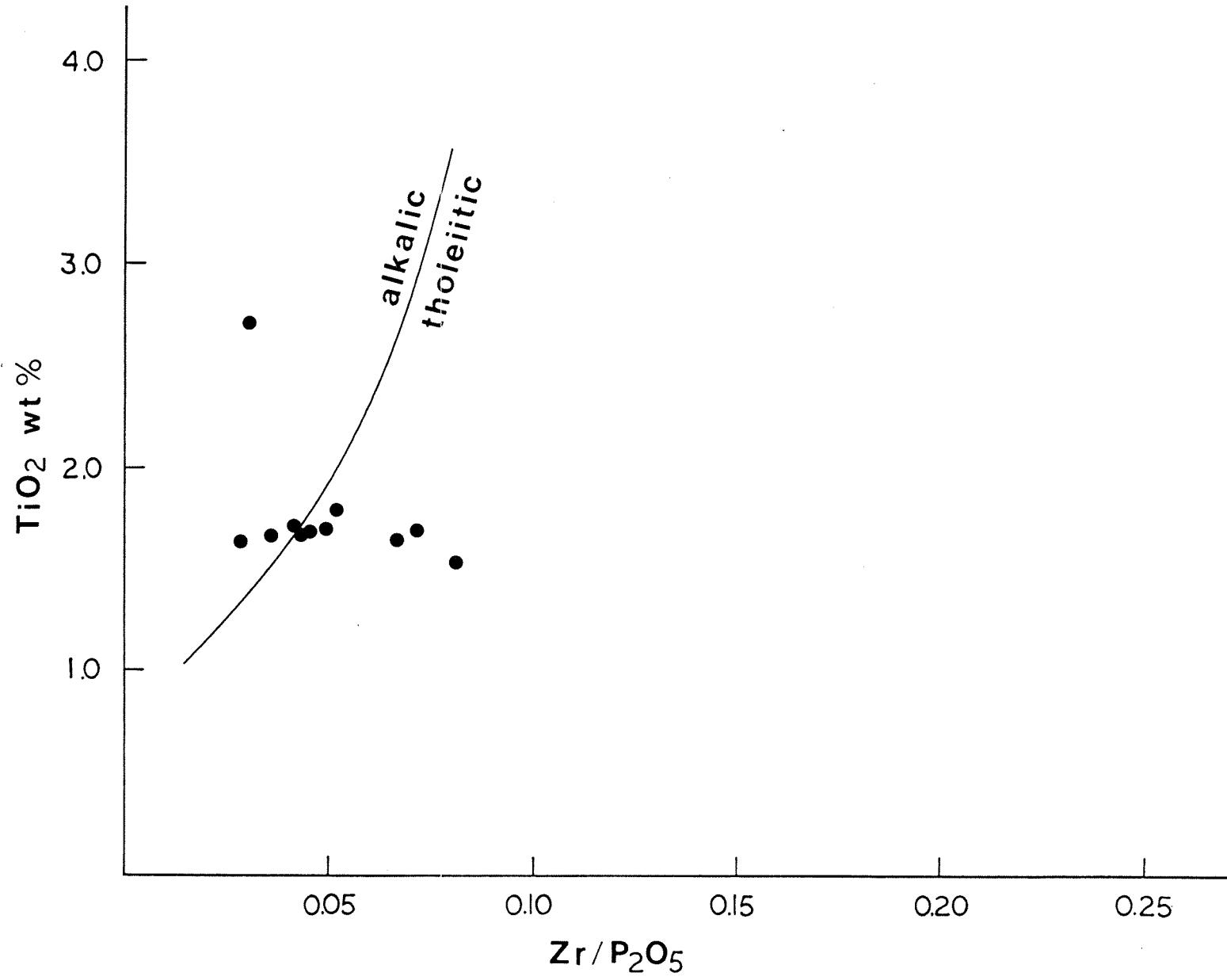


Figure 5. Volcanic rocks in Summerford Group compared to alkalic and tholeiitic fields on a  $\text{TiO}_2$ - $\text{Zr}/\text{P}_2\text{O}_5$  discrimination plot (Winchester and Floyd, 1976).

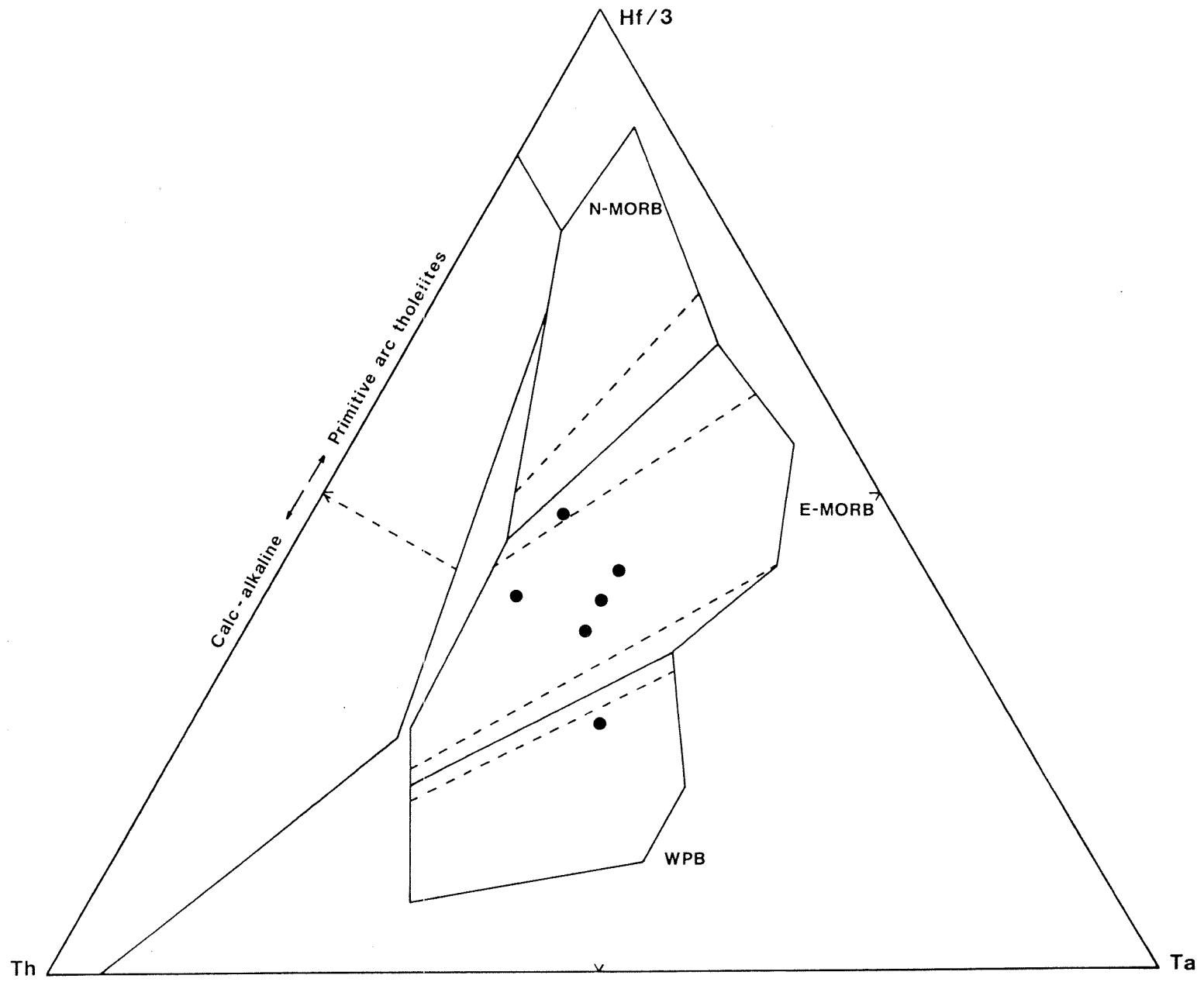


Figure 7. Th-Hf/3-Ta diagram (Wood et al., 1979a) for mafic volcanic rocks in the Summerford Group. N-MORB = normal type midocean ridge basalts, E-MORB = enriched type midocean ridge basalts, WPB = within-plate basalts.

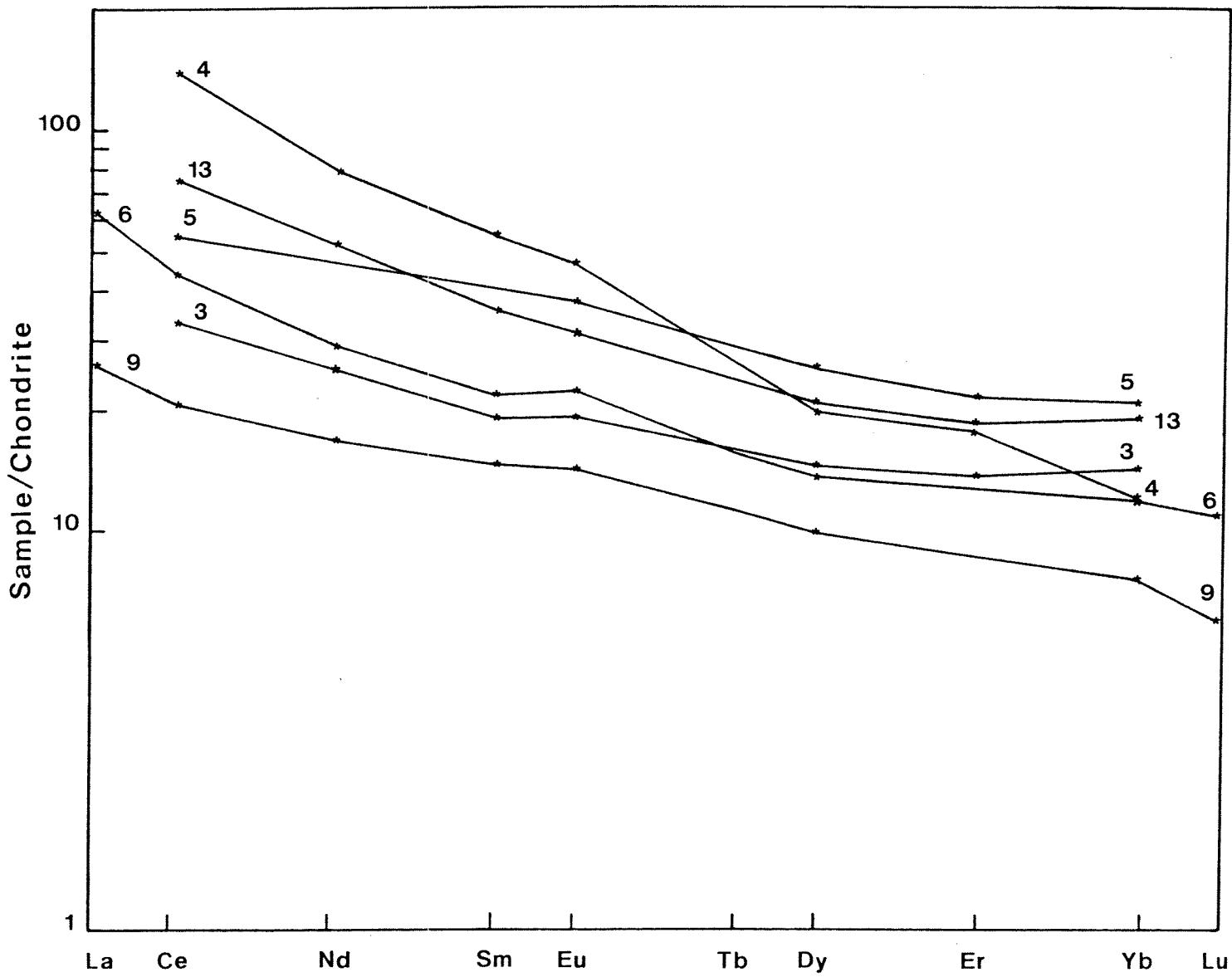


Figure 9. Chondrite normalized rare earth patterns for a mafic volcanic sample from the Summerford Group (sample 5) and for mafic volcanic blocks in the Dunnage melange (from Wasowski and Jacobi, in press).