

# MID-GARDAR FELDSPATHOIDAL DYKES IN THE TUGTUTÔQ REGION, SOUTH GREENLAND

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During the course of a Ph.D. study on the petrology of the mid-Gardar alkaline dykes of the Tugtutôq region, four feldspathoid-bearing dykes were found in material collected by B.G.J. Upton during mapping for the Geological Survey of Greenland, but not microscopically examined by him. These dykes were analysed, but eventually were not included in the text of the thesis. Subsequently, at least three further feldspathoidal dykes were collected during the summer of 1966 (86006–9, 85952, 86080), of which two have now been analysed. Since these are the only recorded examples of undersaturated syenitic rocks intruded in the Tugtutôq area after the consolidation of the giant gabbro dykes, it was felt worthwhile to present the analyses and modes.

In table 2, the terms "augite" and "aegirine-augite" are used in the general sense to indicate colourless, purple and pinkish pyroxenes of the augite-ferroaugite series and green pyroxenes of the hedenbergite-aegirine-augite series respectively. 85952 includes small amounts of an as yet unidentified colourless mineral, prismatic, length-slow and with virtually straight extinction. In these fine-grained rocks, the identification of the feldspathoids and their breakdown products is rather difficult; the figures given in table 2 must therefore be taken as approximate.

## Dansk sammendrag

I tabelform præsenteres analyser af nogle undermættede, feldspatoidførende dykes fra Tugtutôq området.

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Table 1. Analyses of feldspathoidal dykes from the Tugtutôq area

	50104	50121	50193	50195	86080	85952
SiO <sub>2</sub> .....	54.3	53.6	54.1	56.9	60.6	54.5
ZrO <sub>2</sub> .....	0.15	0.26	0.16	0.20	0.43	0.54
TiO <sub>2</sub> .....	1.35	1.02	1.01	0.87	0.18	0.26
Al <sub>2</sub> O <sub>3</sub> .....	14.81	15.24	16.80	15.56	16.82	13.13
Fe <sub>2</sub> O <sub>3</sub> .....	3.71	2.53	3.71	3.21	3.60	11.28
FeO.....	8.12	9.10	6.10	6.61	1.55	0.30
MnO.....	0.28	0.34	0.27	0.28	0.12	0.32
MgO.....	1.15	0.90	1.06	0.38	0.39	0.12
CaO.....	3.70	3.44	2.48	2.12	1.58	1.24
Na <sub>2</sub> O.....	5.51	6.93	6.82	6.70	8.74	9.97
K <sub>2</sub> O.....	4.72	4.83	5.03	4.67	4.66	3.53
P <sub>2</sub> O <sub>5</sub> .....	0.42	0.31	0.32	0.23	0.08	0.17
H <sub>2</sub> O+.....	1.60	0.70	0.97	1.16	0.83	3.20
F.....	0.26	0.35	0.27	0.30	0.77	0.82
Cl.....	0.05	0.17	0.23	0.08	0.07	0.01
	100.13	99.72	99.33	99.27	100.42	99.39
≡ F, Cl.....	0.12	0.19	0.16	0.15	0.34	0.35
Total.....	100.01	99.53	99.17	99.12	100.08	99.04
Agp. Ix.....	0.96	1.09	0.99	1.03	1.16	1.55
F.I.....	70.6	73.9	76.7	79.5	92.9	91.5
Rb.....	160	235	180	190	-	610
Sr.....	120	95	75	115	-	85
Ba.....	290	175	100	175	-	195
Y.....	105	150	100	125	-	635
Nb.....	165	280	280	240	-	1065

50104. Pink, non-porphyritic microsyenite dyke (10 m), Niaqornaq.

50121. Light grey, non-porphyritic microsyenite dyke (8 m), Niaqornaq.

50193. Central part of dark, non-porphyritic microsyenite dyke (6 m), island between Qangué and Tugtutôq, Skovfjord.

50195. Dark grey microsyenite dyke, island in Skovfjord between Qangué and Tugtutôq. Described by Upton as sparsely porphyritic, but analysed specimen aphyric.

86080. Central part of greenish-grey, non-porphyritic 'felsite' dyke, Central Tugtutôq fjord.

85952. Centre of 1.5 m, green, non-porphyritic dyke. Igdlutalik.

Includes La = 1830 p.p.m. and Li = 350 p.p.m.

Analysts: 50104, 50121, 50193, 50195 - R. Macdonald (except Zr, X-Ray Unit, Department of Geology, University of Reading).

86080, 85952 - S. A. Malik, Geochemistry Unit, Reading (major elements) and X-ray Unit (trace elements).

Table 2. CIPW norms and modes of analysed samples. »Alteration products« are mainly hydrated iron oxides. 85952 contains trace amounts of an unidentified mineral (see text)

	50104	50121	50193	50195	86080	85952
Or .....	27.8	28.4	29.5	27.8	27.8	20.6
Ab .....	38.3	27.3	36.1	45.1	46.6	27.8
An .....	1.7	-	1.1	-	-	-
Ne .....	4.5	13.1	11.1	4.8	7.4	10.8
Ac .....	-	5.1	-	1.8	10.6	32.3
Ns .....	-	-	-	-	0.2	-
Di.....	10.7	11.1	6.6	6.3	1.4	-
Ol.....	5.9	8.6	4.6	5.3	2.2	0.5
Mt.....	5.3	1.2	5.3	3.7	-	0.2
Il .....	2.6	2.0	2.0	1.7	0.5	0.6
Ap.....	1.0	0.7	0.7	0.3	0.3	0.3
Z .....	0.4	0.4	0.4	0.4	0.7	1.3
CaF <sub>2</sub> .....	0.5	0.7	0.5	0.6	1.6	1.5
Hl.....	-	0.3	0.2	0.1	0.1	-
Feldspar .....	65.8	64.2	55.7	70.3	64.0	15.0
Nepheline.....		8.1	-			-
Giesekite.....	5.7	-	6.0	3.0	3.4	
Analcime.....		-	-			25.0
Prehnite.....						
Cancrinite.....	-	-	-	-	-	3.0
Olivine (+ iddingsite).....	+	3.3	0.9	0.6	-	-
Pyroxene						
"Augite".....	11.7	6.7	14.0	9.8	-	-
"Aegirine-augite".....		4.5			-	-
Aegirine .....	-	-	-	-	19.3	45.0
Amphibole						
"Soda-hornblende".....	4.5	7.2	12.5	0.9	-	-
"Riebeckite-arfvedsonite"	-		-		-	+
Aenigmatite .....	1.8	4.9	2.0	1.8	0.6	-
Fe-Ti oxide.....	3.0	+	8.2	0.5	-	-
Mica						
-green .....	6.1	1.0	0.7	12.1	12.0 (= green only)	
-orange .....						
brown .....						
Apatite .....	+	+	+	+	-	-
Astrophyllite .....	-	-	-	-	-	+
Fluorite.....	-	-	-	-	0.7	-
Alteration products.....	1.3	-	-	-	-	12.0