would have to be emplaced into oceanic crust. Xenoliths and fragments of mafic supracrustal rocks are actually present both in dioritic and tonalitic grey gneiss, but the picture is complicated by the fact that some of the dioritic gneiss represents an earlier continental nucleus. Furthermore, in the absence of age determinations of the supracrustal units, still more complicated tectonic scenarios could easily be advanced.

Acknowledgements

This study would not have been possible without help from many persons in various phases of the work. I thank colleagues and assistants during field work, especially Mogens Marker and the late Stig Bak Jensen, and I am grateful to Vic McGregor for his excellent introduction to the field geology of the Godthåbsfjord region. I would also like to thank the staff at the geochemical and isotope laboratories in Copenhagen and abroad, in particular John Bailey, Jørgen Christensen, John Fløng, Ole Larsen, Svend Pedersen and Jørn Rønsbo, University of Copenhagen, the staff at the former Geological Survey of Greenland laboratories, Allen Nutman, Australian National University, and Paul Taylor, Oxford University. I am also very grateful to the former Geological Survey of Greenland and in particular Hans Kristian Schønwandt for encouragement and support, and to Feiko Kalsbeek for always very precise and constructive discussions and comments. Several other present and former colleagues at the Survey have contributed with valuable comments at various stages of the study, especially Lotte Melchior Larsen, Mogens Marker, Flemming Mengel, Agnete Steenfelt and Cees Swager. Thanks also to David Bridgwater, University of Copenhagen, and Clark Friend, Oxford Brookes University, who performed very constructive reviews of the text. The Danish Natural Science Research Council is thanked for financing a very substantial part of the publication.

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Appendixes

All samples listed in Appendixes 1–13 are GGU samples (GGU = Grønlands Geologiske Undersøgelse).

Analytical procedures. Major element analysis at the Geological Survey of Greenland; most elements by XRF on fused glass disks, except Fe_2O_3 by titration and Na_2O by atomic absorption spectrometry. Trace elements analysed by XRF on pressed powder pellets at the Geological Institute, University of Copenhagen (analysts J. C. Bailey and J. Christensen). Further details concerning the analytical methods, and information about detection limits and precision of the XRF methods at these laboratories can be found in Blichert-Toft *et al.* (1995).

†: INNA at Activation Laboratories Ltd., Canada ('research grade' analyses). In some samples Th, La, Ce and Nd were analysed by both INNA and XRF on pressed powders. For these elements the INNA method has lower detection limits and a better precision at low concentrations. Otherwise agreement between the two sets of analyses is good (generally within 10%), and no corrections to the results obtained by either method have been made. Where these elements appear in figures displaying geochemical data, the accompanying text to the first figure indicates which analytical method was used.

Appendix 1. Chemical compositions of homogeneous amphibolites from the Fiskefjord area

GGU	Retrogressed		Granulite facies			all samples		granulite facies		retrogressed	
No	289141	289120	278758	339508	278849	average (*n=31*)	s.d.	average (*n=22*)	s.d.	average (*n=9*)	s.d.
SiO_2	47.64	49.45	50.74	51.34	55.66	50.43	2.62	50.88	2.72	49.33	2.09
TiO_2	0.62	0.73	0.54	0.46	0.78	0.67	0.15	0.64	0.11	0.76	0.20
Al_2O_3	15.06	14.61	14.19	15.58	17.09	15.17	1.04	15.44	1.11	14.53	0.43
Fe_2O_3	3.44	4.32	2.82	2.41	2.33	3.14	0.95	2.84	0.78	3.87	0.98
FeO	7.32	7.34	7.36	5.61	5.36	7.59	1.31	7.63	1.48	7.51	0.82
FeO*	10.42	11.23	9.90	7.78	7.46	10.42	1.61	10.19	1.65	10.99	1.44
MnO	0.18	0.20	0.15	0.15	0.11	0.17	0.03	0.17	0.03	0.19	0.02
MgO	10.42	7.71	10.16	9.42	6.65	8.39	0.89	8.35	0.75	8.50	1.23
CaO	10.88	10.57	9.36	9.31	7.15	9.94	1.92	9.72	2.10	10.48	1.35
Na_2O	2.15	2.75	2.98	3.51	3.77	2.67	0.59	2.74	0.63	2.49	0.45
K_2O	0.54	0.58	0.76	0.83	0.42	0.57	0.32	0.60	0.35	0.48	0.19
P_2O_5	0.03	0.05	0.04	0.08	0.17	0.09	0.05	0.09	0.05	0.09	0.05
l.o.i.	1.61	1.34	0.98	0.91	0.35	1.12	0.38	0.97	0.34	1.49	0.15
Sum	99.89	99.65	100.08	99.61	99.84	99.96 (*n=26*)	0.37	100.06 (*n=19*)	0.35	99.71 (*n=7*)	0.29
Rb	9	3.3	7.7	5	1	9	14	10	16	5	4
Ba	108	111	178	29	193	150	115	157	122	130	99
Pb	1	1	3	9	4	3	3	3	3	3	2
Sr	113	161	182	311	417	177	106	182	113	163	90
La	9	5		11	8	6	5	6	5	7	4
Ce	9	10		23	11	10	9	10	10	11	4
Nd	7	8	3	11	11	8	5	8	5	8	2
Y	17	19	14	13	17	18	4	18	3	17	6
Th	<1	<1	<1	<1	<1	<1			<1	<1	
Zr	41	40	37	42	123	59	35	60	39	56	23
Nb	2	3.7	3	3	4	3	1	3	2	3	1
Zn	83	104	59	82	69	91	16	88	14	98	19
Cu	25	57	11	9	41	44	57	34	44	70	82
Co	75	62	74	57	48	68	8	68	9	67	8
Ni	219	148	142	143	90	146	50	145	49	150	58
V	214	260	229	177	161	232	52	225	50	252	57
Cr	571	317	690	697	236	409	182	405	196	419	149
Ga	14	17	14	16	22	18 (*n=13*)	5	18	2	20	10
Cs †	0.2	0.2	0.2	0.2	0.2	0.3	0.1				
Hf †	1.0	1.0	0.6	1.0	3.2	1.1	0.8				
Sc †	31.1	37.8	36.3	31.2	23.5	35.4	6.7				
Ta †	<0.3	<0.3	<0.3	<0.3	<0.3						
Th †	0.2	0.4	0.8	0.7	0.1	0.4	0.3				
U †	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
La †	3.8	5.0	4.3	10.4	10.6	6.1	3.6				
Ce †	9	12	9	21	20	12.8	6.3				
Nd †	5	7	5	10	11	7.2	3.1				
Sm †	1.51	1.83	1.37	2.23	2.75	1.89	0.55				
Eu †	0.60	0.64	0.58	0.7	0.88	0.68	0.14				
Tb †	0.4	0.5	0.4	0.4	0.6	0.5	0.1				
Yb †	1.7	2.02	1.78	1.51	1.84	2.00	0.36				
Lu †	0.21	0.27	0.22	0.20	0.23	0.26	0.05				

Representative analyses, grand average, and averages of 22 amphibolites with granulite facies parageneses, and of nine amphibolites with textural evidence of partial rehydration. Sample localities are shown in Fig. 17.

Appendix 2. Chemical compositions of various amphibolites from the Fiskefjord area

GGU	Leuco-amphibolite						Eastern amphibolite		Heterogeneous amphibolite			
No	339180	278792	278835	289199	average (*n*=8)	s.d.	289205	289166	278848	278744	278788	289204
SiO_2	53.05	55.92	59.19	63.80	57.23	4.80	48.60	50.24	47.17	49.57	51.43	53.40
TiO_2	0.86	0.87	0.73	0.50	0.77	0.26	0.55	0.87	0.30	1.11	0.62	0.85
Al_2O_3	18.39	16.78	17.40	17.09	16.96	1.56	18.78	17.33	20.98	14.59	15.41	17.80
Fe_2O_3	2.67	1.97	1.28	1.21	2.49	1.34	1.94	3.59	4.02	5.22	2.26	1.45
FeO	5.24	6.43	6.24	3.22	4.83	1.22	6.74	6.91	4.96	8.75	6.03	5.28
FeO*	7.64	8.20	7.39	4.31	7.07	1.85	8.49	10.14	8.58	13.45	8.06	6.59
MnO	0.12	0.11	0.11	0.06	0.12	0.03	0.15	0.18	0.18	0.22	0.16	0.13
MgO	4.69	3.89	3.66	2.24	3.67	0.82	7.56	5.39	3.67	3.55	4.87	3.09
CaO	8.34	7.22	4.94	5.18	7.30	2.13	11.50	9.79	14.52	12.80	14.62	14.67
Na_2O	2.05	4.02	4.50	4.31	3.78	0.95	2.55	3.98	2.20	3.04	2.70	1.92
K_2O	0.32	1.13	0.81	1.06	0.83	0.38	0.36	0.63	0.72	0.42	0.33	0.13
P_2O_5	0.27	0.25	0.15	0.13	0.24	0.15	0.08	0.16	0.22	0.07	0.13	0.07
l.o.i.	1.44	0.92	0.54	0.62	1.02	0.47	1.24	1.18	0.93	1.06	1.52	1.52
Sum	97.44	99.51	99.55	99.42	99.21	0.72	100.05	100.25	99.87	100.40	100.08	100.31
Rb	1	34	6	42	25	26	3	2	20	2	2	2
Ba	322	291	275	352	327	160	13	68	221	57	179	16
Pb	7	6	<1	6	6	3	2	<1	<1	4	7	5
Sr	726	340	340	490	478	225	226	259	204	123	583	191
La	20	31	11	16	30	21	13	16	26	<1	12	7
Ce	53	32	21	29	48	35	11	25	26	8	30	16
Nd	31	43	11	12	27	17	6	14	15	7	17	10
Y	16	22	13	50	22	12	1	23	16	33	16	180
Th	<1	<1	<1	<1	<1		<1		<1	<1	<1	<1
Zr	73	136	152	89	111	44	50	83	42	65	53	83
Nb	4	6	5	4	6	2	4	5	2	3	4	4
Zn	97	81	56	57	83	25	70	121	78	165	73	80
Cu	51	5	<1	11	18	16	8	<1	6	35	15	36
Co	42	11	63	40	48	20	57	68	52	88	55	69
Ni	58	49	52	17	52	24	144	57	21	65	151	94
V	159	133	122	58	129	44	157	168	190	323	181	158
Cr	49	166	145	39	115	102	346	110	32	148	488	194
Ga	22	20	20	21	20	3	18	18	15	19	12	19
Cs †	0.4	1.4	0.2				0.2	0.2				
Hf †	1.4	3.3	3.8				1.3	2.0				
Sc †	19.8	18.6	17.6				28.3	27.7				
Ta †	0.5	0.4	0.4				0.3	0.6				
Th †	0.3	3.9	0.1				0.8	1.2				
U †	0.1	0.8	0.1				0.1	0.3				
La †	21.8	28.1	10.8				5.7	11.6				
Ce †	44	51	20				13	25				
Nd †	26	23	11				7	12				
Sm †	4.88	4.49	2.24				1.7	2.82				
Eu †	1.47	1.42	0.88				0.62	0.91				
Tb †	0.7	0.7	0.4				0.4	0.5				
Yb †	1.59	2.36	1.3				1.83	2.39				
Lu †	0.21	0.3	0.18				0.28	0.3				

Representative samples and average of leuco-amphibolite, and examples of eastern amphibolite and heterogeneous amphibolite. Sample localities are shown in Fig. 17.

Appendix 3. Chemical compositions of metasediments from the Fiskefjord area

GGU	Quartzo-feldspathic metasediment				Biotite schist			
No	289161	289191	289163	283361	289046	339573	283718	339926
SiO_2	61.04	61.35	62.03	68.08	50.08	57.16	61.53	62.37
TiO_2	0.54	1.24	0.55	0.36	1.28	0.79	0.44	1.34
Al_2O_3	15.89	15.66	15.62	16.68	15.30	19.52	16.71	10.68
Fe_2O_3	1.38	3.05	1.36	0.38	8.50	5.45	1.70	4.69
FeO	3.87	4.72	4.51	2.21	8.91	5.69	4.17	9.20
FeO*	5.11	7.47	5.73	2.55	16.56	10.60	5.70	13.42
MnO	0.10	0.11	0.10	0.05	0.19	0.13	0.08	0.10
MgO	3.56	2.35	3.90	1.06	4.12	4.30	4.07	7.92
CaO	6.54	4.69	5.63	3.29	3.62	2.27	6.30	1.38
Na_2O	3.76	3.95	3.73	4.52	2.60	2.05	3.03	1.64
K_2O	1.61	1.70	1.02	2.70	1.97	1.46	0.47	0.21
P_2O_5	0.15	0.18	0.14	0.13	0.24	0.06	0.15	0.07
l.o.i.	0.66	0.73	0.64	0.25	3.20	1.54	1.06	0.86
Sum	99.10	99.73	99.23	99.72	100.01	100.41	99.70	100.46
Rb	58	94	22	83	72	44		2.4
Ba	518	245	544	589	226	536		67
Pb	10	10	9	25	22	5		6
Sr	215	191	235	279	60	208		22
La	25	18	23	31	7	5		7
Ce	40	39	30	58	29	11		12
Nd	17	22	15	25	17	3		9
Y	14	34	12	6	31	14		58
Th	4	7	2	8	<1	1		4
Zr	137	188	119	113	134	63		97
Nb	6.7	8.6	5	4.1	7.9	3		4.3
Zn	72	101	81	63	384	165		98
Cu	8	19	<1	13	115	95		<1
Co	51	49	59	18	82	155		112
Ni	70	34	58	7	7	302		64
V	91	184	95	33	249	342		185
Cr	146	14	161	11	28	643		0
Ga	17	21	19	19	21	25		28
Sc	12	19	13	5		46		92

Sample localities are shown in Fig. 17.

Appendix 4. Chemical compositions of norite, ultramafic rocks and anorthosite from the Fiskefjord area

GGU	Norite							Ultramafic rocks								Anorthosite	
No	339922	289145	339163	278710	339164	average (n=5)	s.d.	328286	339564	328269	339538	289109	283710	average (n=6)	s.d.	339501	125763 Fiskenæsset
SiO_2	49.09	49.43	49.62	49.81	50.41	49.67	0.49	45.63	47.25	47.47	49.47	50.50	54.09	49.07	17.29	47.13	48.97
TiO_2	0.19	0.07	0.11	0.11	0.12	0.12	0.04	0.29	0.39	0.67	0.53	0.51	0.09	0.41	3.04	0.21	0.12
Al_2O_3	19.36	20.76	20.24	17.74	16.75	18.97	1.69	7.17	9.91	6.42	6.08	7.18	1.24	6.33	2.60	29.74	31.41
Fe_2O_3	1.76	1.51	2.01	0.89	2.80	1.79	0.70	6.00	5.07	4.27	4.36	3.11	0.80	3.94	2.47	0.00	0.25
FeO	7.25	4.10	4.10	6.76	4.60	5.36	1.52	6.71	6.29	9.05	7.80	8.45	3.86	7.03	2.55	2.73	0.75
FeO*	8.83	5.46	5.91	7.56	7.12	6.98	1.34	12.11	10.85	12.89	11.72	11.25	4.58	10.57	3.97	2.73	0.97
MnO	0.18	0.12	0.15	0.15	0.15	0.15	0.02	0.21	0.20	0.26	0.22	0.22	0.16	0.21	3.12	0.06	0.03
MgO	11.81	11.43	10.76	13.97	15.94	12.78	2.14	28.28	18.52	13.83	18.50	13.71	19.79	18.77	7.17	2.21	0.90
CaO	9.82	10.75	10.05	9.29	7.45	9.47	1.25	5.22	10.03	14.90	10.80	13.44	16.82	11.87	4.77	15.31	14.63
Na_2O	0.96	1.09	1.69	0.80	1.16	1.14	0.34	0.12	0.95	1.41	0.96	1.41	0.51	0.89	2.88	1.88	1.79
K_2O	0.04	0.29	0.65	0.09	0.54	0.32	0.27	0.07	0.16	0.43	0.54	0.23	0.02	0.24	3.11	0.29	0.46
P_2O_5	0.05	0.01	0.05	0.00	0.05	0.03	0.02	0.04	0.07	0.09	0.05	0.04	0.02	0.05	3.18	0.05	0.10
l.o.i.	0.74	0.59	0.87	0.82	0.75	0.75	0.11	0.76	1.25	1.30	0.78	1.35	2.02	1.24	2.74	0.58	0.44
Sum	101.25	100.15	100.29	100.43	100.71	100.57	0.43	100.49	100.09	100.09	100.10	100.15	99.42	100.06	0.35	100.19	99.85
Rb	1	16	31	1	13	12	13		3		6	4				3.5	26
Ba	23	27	139	23	47	52	50		39		70	30				93	33
Pb	2	1	9	<1	<1	2	4		2		2	1				5	5
Sr	54	64	63	43	61	57	9		42		31	71				149	83
La																<2	11
Ce																5	18
Nd	<2	<2	2	<2	<2	<2			5		8	6				1	6
Y	5	2	3	4	3	3	1		10		16	15				4	2
Th	<1	<1	<1	<1	<1	<1			<1		<1	<1				1	3
Zr	10	5	12	4	11	8	4		31		52	34				12	6
Nb	1	1	1	1	1	1	0		2		5	3				2.1	<1
Zn	60	40	47	47	62	51	9		87		117	92				34	8
Cu	<2	9	<2	<2	<2	2	4		47		20	22				5	17
Co	78	65	53	74	71	68	10		90		109	83				55	13
Ni	134	203	102	192	247	176	58		655		981	237				57	25
V	153	89	113	152	142	130	28		188		180	252				70	28
Cr	109	399	173	263	949	379	337		2340		1860	1170				101	232
Ga	4	11	12	13	9	10	4		13		14	11				18	21
Cs †	<0.2	0.5	1.5	<0.2	1.0			<0.2	<0.2	<0.2	0.6	<0.2	<0.2	<0.2			
Hf †	<0.2	<0.2	0.4	0.2	0.2	0.3	0.1	0.4	0.6	1.1	0.6	0.9	<0.2	0.6	0.4		
Sc †	38.8	21.1	27.0	33.3	31.6	30.4	6.7	22.6	30.9	49.1	21.5	45.4	41.4	35.2	11.8		
Ta †	<0.3	<0.3	<0.3	<0.3	0.3	<0.3		<0.3	<0.3	<0.3	0.3	<0.3	<0.3	<0.3			
Th †	<0.1	0.1	0.9	0.1	<0.1			0.2	0.4	<0.1	0.2	0.1	0.2	0.2	0.1		
U †	<0.1	<0.1	0.3	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			
La †	0.6	0.8	3.3	0.7	1.0	1.3	1.1	1.8	2.4	3.8	5.3	3.7	1.7	3.1	1.4		
Ce †	2	2	5	2	2	3	1.3	4	6	9	14	10	4	8	4		
Nd †	1	1	2	<1	1	1	0.7	2	4	6	9	6	1	5	3		
Sm †	0.26	0.15	0.28	0.23	0.18	0.22	0.05	0.6	0.87	1.84	2.2	1.54	0.18	1.21	0.78		
Eu †	0.21	0.14	0.16	0.14	0.14	0.16	0.03	0.22	0.45	0.8	0.87	0.51	0.07	0.49	0.31		
Tb †	0.1	0.1	0.1	<0.1	0.1	0.1	0.1	0.2	0.2	0.5	0.5	0.3	0.0	0.3	0.2		
Yb †	0.90	0.38	0.54	0.62	0.38	0.56	0.21	0.86	1.16	1.54	1.52	1.40	0.25	1.12	0.50		
Lu †	0.12	0.05	0.07	0.08	0.06	0.08	0.03	0.12	0.17	0.19	0.19	0.18	0.03	0.15	0.06		

Sample localities shown in Fig. 17. Anorthosite sample GGU 125763 from the Fiskenæsset complex, southern West Greenland (Ashwal & Myers, 1994) shown for comparison.

Appendix 5. Chemical compositions of dioritic grey gneiss, Fiskefjord area

GGU	Amphibolite facies						Granulite facies						Retrogressed					
No	283366	289273	283331	289272	average (*n=7*)	s.d.	283630	283672	289160	283673	average (*n=20*)	s.d	283680	278752	278711	278767	average (*n=10*)	s.d
SiO_2	57.98	58.50	62.40	63.25	60.67	2.32	52.63	56.29	57.63	63.26	57.13	3.71	55.06	61.39	62.36	63.63	60.49	2.61
TiO_2	0.89	0.55	0.62	0.57	0.63	0.12	1.10	1.01	0.65	0.65	0.79	0.19	1.05	0.60	0.58	0.63	0.71	0.17
Al_2O_3	18.89	16.92	16.09	15.43	16.53	1.17	19.07	19.35	15.42	15.92	16.95	1.29	16.97	14.86	15.77	15.86	16.24	0.95
Fe_2O_3	2.35	1.42	1.42	1.33	1.54	0.39	4.06	3.69	2.60	2.30	3.13	1.02	3.19	1.78	1.67	1.89	2.10	0.49
FeO	3.96	4.58	4.04	3.99	4.29	0.38	5.14	3.78	5.25	4.22	4.63	0.92	5.87	4.12	4.04	3.69	4.40	0.64
FeO*	6.08	5.86	5.32	5.19	5.67	0.43	8.79	7.10	7.59	6.29	7.46	1.64	8.74	5.72	5.54	5.39	6.29	1.01
MnO	0.09	0.11	0.10	0.10	0.10	0.01	0.13	0.12	0.14	0.12	0.14	0.03	0.15	0.09	0.09	0.08	0.11	0.02
MgO	2.07	4.23	3.07	3.23	3.42	0.75	3.53	2.26	5.25	2.64	3.78	1.22	4.26	4.70	3.13	2.46	3.44	0.85
CaO	6.16	6.47	5.53	5.12	5.87	0.52	7.95	7.11	6.96	5.53	7.66	1.15	7.56	4.79	5.15	5.19	5.80	0.90
Na_2O	5.05	4.40	4.19	3.88	4.23	0.40	5.02	4.93	4.22	3.96	4.10	0.60	3.49	3.50	4.10	4.48	3.96	0.46
K_2O	1.43	1.41	1.38	1.78	1.51	0.14	0.27	0.75	0.76	0.63	0.64	0.20	0.96	1.59	0.91	0.97	1.13	0.24
P_2O_5	0.28	0.19	0.20	0.17	0.20	0.04	0.30	0.24	0.10	0.12	0.17	0.06	0.15	0.13	0.16	0.14	0.18	0.04
l.o.i.	0.44	0.51	0.45	0.44	0.48	0.04	1.05	0.33	0.50	0.39	0.59	0.38	1.03	1.33	1.06	0.54	0.87	0.37
Sum	99.59	99.30	99.49	99.29	99.47 (*n=5*)	0.18	100.25	99.86	99.48	99.73	99.72	0.24	99.73	98.88	99.02	99.56	99.42	0.30
Rb		42		74	58	12	<1	2	7	2	4	3	24	60	13	12	28	16
Ba		384		444	420	33	349	243	218	263	237	163	304	397	335	377	361	84
Pb		9		10	9	1	8	9	5	6	7	3	8	3	4	3	6	4
Sr		409		286	351	48	669	428	217	220	283	143	220	326	415	390	335	94
La		21		28	24	3	11	14	13	10	13	3	16	23	18	18	18	3
Ce		39		43	38	3	27	28	20	22	28	8	35	47	36	33	34	8
Nd		19		21	17	5	18	16	13	11	16	4	22	26	17	19	19	4
Y		13		15	14	1	11	17	16	13	19	6	25	24	16	10	20	7
Th		5		7	4	2	2	1	<1	<1	2	1	3	1	1	<1	1	1
Zr		82		120	111	20	19	256	137	80	119	68	251	161	112	91	137	49
Nb		5.7		7.2	6.4	0.6	3.1	6.5	4.4	2.9	5.8	2.0	9.7	9.5	6.2	6.8	7.5	1.3
Zn		74		65	71	7	103	75	84	67	89	19	116	67	67	81	78	16
Cu		6		<1	4	3	102	31	0	44	21	23	26	10	10	<1	13	8
Co		37		31	33	2	41	41	64	56	55	12	47	42	45	70	49	13
Ni		82		56	67	10	25	17	124	40	55	27	53	85	50	26	52	22
V		112		90	103	12	188	93	127	104	138	42	236	98	86	71	109	47
Cr		195		160	175	18	13	12	172	42	81	55	87	253	110	65	123	78
Ga		18		15	17	1	22	22	18	17	20	2	21	19	16	18	19	2
Sc		15		14	15 (*n=5*)	1	17	13	19	14	21 (*n=6*)	7	25	16	12		19 (*n=3*)	6
Cs †		2.2		2.0	2.3	0.2		<0.1	<0.1	<0.1	0.1	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Hf †		2.8		2.3	2.8	0.5		4.6	2.6	2.0	3.0	0.9		4.8	3.6	2.2	3.5	1.3
Sc †		14.6		12.6	14.0	1.1		14.4	18.7	13.7	18.0	3.8		15.9	12.6	10.4	13.0	2.8
Ta †		0.0		0.5	0.5	0.3		0.4	0.8	<0.3	0.4	0.3		0.5	0.5	<0.3	0.3	0.3
Th †		1.7		6.3	2.8	1.9		0.0	0.0	0.1	0.3	0.4		0.9	1.4	0.4	0.9	0.5
U †		0.0		1.1	0.6	0.4		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1
La †		20.2		25.5	22.1	2.0		12.2	10.1	11.2	12.8	2.8		21.5	17.2	18.5	19.1	2.2
Ce †		35		43	38	4		23	19	18	24	6		43	31	35	36	6
Nd †		15		17	16	2		12	10	9	13	4		23	15	16	18	4
Sm †		2.84		3.11	2.95	0.15		2.77	2.18	1.92	2.84	0.78		4.64	2.87	2.76	3.42	1.06
Eu †		0.93		0.86	0.91	0.04		1.09	0.80	0.74	0.94	0.15		0.90	0.91	0.81	0.87	0.06
Tb †		0.3		0.4	0.4	<0.3		0.4	0.5	0.4	0.5	0.1		0.7	0.6	0.4	0.6	0.2
Yb †		1.17		1.31	1.25	0.05		1.39	1.51	1.28	1.78	0.50		2.22	1.77	0.97	1.65	0.63
Lu †		0.15		0.17	0.16	0.01		0.18	0.19	0.16	0.23	0.06		0.26	0.27	0.13	0.22	0.08

Representative samples and averages of all analyses (amphibolite facies, granulite facies and retrogressed). Sample locations in Fig. 52.

Appendix 6. Chemical compositions, Qeqertaussaq diorite, Fiskefjord area

GGU	(Variably retrogressed)						
No	328565	328563	328567	339223	339224	average (*n*=22)	s.d.
SiO_2	55.16	56.77	58.14	59.40	64.75	58.84	3.35
TiO_2	0.97	0.68	0.65	0.61	0.38	0.62	0.20
Al_2O_3	18.05	17.84	17.41	16.94	16.95	17.47	0.79
Fe_2O_3	3.80	3.19	2.91	2.60	0.90	2.39	0.83
FeO	3.57	3.35	3.29	3.34	2.41	3.19	0.73
FeO*	6.99	6.22	5.91	5.68	3.22	5.34	1.28
MnO	0.11	0.12	0.12	0.12	0.07	0.10	0.02
MgO	3.12	3.59	3.24	3.02	1.96	3.01	0.64
CaO	6.29	5.77	5.87	5.76	4.02	5.54	0.99
Na_2O	5.45	5.76	4.94	5.34	5.34	5.21	0.61
K_2O	1.19	1.45	1.46	0.94	0.95	1.61	0.81
P_2O_5	0.63	0.25	0.37	0.36	0.27	0.38	0.10
l.o.i.	1.02	0.91	0.72	0.82	1.02	0.86	0.26
Sum	99.35	99.67	99.12	99.25	99.01	99.21	0.60
Rb	10	10	10	4	4	17	14
Ba	755	896	1400	1560	1690	1465	811
Pb	17	18	19	14	12	18	8
Sr	1050	1190	1200	1100	980	1240	290
La	40	38	46	40	43	52	27
Ce	101	85	95	78	83	106	48
Nd	59	40	47	40	34	51	20
Y	25	16	16	15	5	16	5
Th	2	2	2	<1	2	5	8
Zr	115	65	110	114	91	120	27
Nb	9.0	5.4	5.4	4.3	2.0	4.9	1.7
Zn	115	100	94	88	71	90	13
Cu	51	13	33	15	27	26	16
Co	34	40	35	41	42	39	8
Ni	30	42	18	20	17	31	16
V	123	128	124	115	50	103	29
Cr	17	39	29	25	18	40	26
Ga	25	21	22	20	19	21	2
Sc	14	15	17	14	23	14 (*n=5*)	4
Cs †	<0.1	<0.1	<0.1	<0.1	0.5	0.1	0.2
Hf †	3.1	1.7	3.5	2.0	2.0	2.5	0.8
Sc †	12.4	15.2	14.2	13.2	13.9	13.8	1.1
Ta †	0.5	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Th †	0.7	1.5	0.4	0.5	0.9	0.8	0.4
U †	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.4
La †	45.0	41.5	48.2	43.4	50.5	45.7	3.6
Ce †	87	75	79	72	74	77	6
Nd †	45	34	37	34	29	36	6
Sm †	8.66	5.78	6.24	6.18	4.08	6.19	1.64
Eu †	2.11	1.90	1.72	1.69	1.28	1.74	0.31
Tb †	0.9	0.7	0.7	0.7	0.4	0.7	0.2
Yb †	1.93	1.41	1.35	1.29	0.30	1.26	0.59
Lu †	0.24	0.19	0.19	0.17	0.05	0.17	0.07

Representative samples and average of all analyses. The Qeqertaussaq diorite is enriched in P_2O_5, LREE and several LIL elements but depleted in high field strength elements relative to dioritic grey gneiss. Sample locations in Fig. 52.

Appendix 7. Chemical compositions of amphibolite and granulite facies tonalitic-trondhjemitic grey gneiss, Fiskefjord area

GGU	Amphibolite facies								Granulite facies							
No	339558	283347	289278	283343	289280	289279	average (*n=19*)	s.d.	278754	339551	278756	339550	328250	339528	average (*n=19*)	s.d.
SiO_2	65.06	67.99	69.41	72.07	73.92	74.73	71.04	2.61	62.19	63.99	66.53	70.93	72.36	73.45	69.22	4.20
TiO_2	0.71	0.39	0.13	0.19	0.06	0.05	0.25	0.15	0.71	0.48	0.51	0.35	0.29	0.17	0.35	0.17
Al_2O_3	16.49	16.36	17.24	15.68	13.98	14.24	15.48	1.01	17.03	17.07	16.47	14.52	15.67	14.17	15.64	1.17
Fe_2O_3	0.30	0.82	0.36	0.21	0.17	0.15	0.36	0.22	1.74	1.21	1.25	1.80	0.33	1.19	1.07	0.50
FeO	3.05	2.12	0.97	0.96	0.55	0.56	1.37	0.68	3.99	2.97	2.82	1.99	0.84	1.09	2.09	0.91
FeO*	3.32	2.86	1.29	1.15	0.70	0.70	1.69	0.77	5.56	4.06	3.95	3.61	1.14	2.16	2.91	1.26
MnO	0.04	0.05	0.03	0.04	0.01	0.02	0.03	0.01	0.08	0.08	0.05	0.06	0.03	0.03	0.06	0.02
MgO	1.29	0.97	0.44	0.38	0.08	0.08	0.57	0.37	2.34	2.56	1.47	0.93	0.41	0.49	1.24	0.73
CaO	3.12	3.60	3.27	2.00	1.32	1.09	2.52	0.91	5.66	5.35	4.65	3.75	3.36	3.48	4.10	0.89
Na_2O	4.40	4.66	5.48	5.80	2.89	4.67	4.71	0.68	4.78	4.45	4.83	4.05	4.38	4.35	4.49	0.35
K_2O	3.66	1.40	1.84	1.74	5.83	4.03	2.65	1.47	0.74	0.31	0.61	0.35	0.79	0.51	0.68	0.27
P_2O_5	0.25	0.13	0.04	0.06	0.02	0.02	0.08	0.05	0.20	0.18	0.15	0.11	0.03	0.07	0.12	0.05
l.o.i.	0.88	0.24	0.11	0.11	0.06	0.06	0.24	0.24	0.33	0.52	0.41	0.30	0.21	0.18	0.36	0.16
Sum	99.26	98.73	99.32	99.25	98.89	99.70	99.27 (n=18)	0.35	99.79	99.16	99.75	99.15	98.69	99.19	99.41	0.33
Rb	135	81	40	99	114	94	81	26	4	<1	2	<1	2	1	4	10
Ba	1490	449	411	453	1100	273	691	361	328	313	512	355	816	364	430	189
Pb	30	15	15	24	37	32	22	7	2	5	8	6	13	8	7	2
Sr	371	381	728	475	250	183	382	146	540	586	559	227	921	287	417	266
La	146	19	3	14	7	3	27	36	13	13	10	7	9	10	13	5
Ce	290	46	4	17	10	5	47	68	37	17	15	16	14	18	24	9
Nd	99	14	3	8	7	3	17	23	23	8	10	6	4	7	11	5
Y	28	6	2	6	2	2	6	6	9	5	4	4	<1	1	7	7
Th	35	16	1	6	16	4	12	9	<1	<1	<1	<1	3	2	1	2
Zr	387	159	42	80	37	13	122	88	141	119	109	228	185	124	134	46
Nb	12.0	4.6	2.5	3.3	1.2	3.6	4.0	2.6	6.5	1.4	3.0	1.7	0.9	1.0	3.1	2.1
Zn	65	66	23	49	5	12	39	17	79	68	60	52	19	41	53	17
Cu	38	8	3	<1	<1	3	6	8	18	4	11	4	10	5	12	14
Co	47	11	21	16	23	30	31	24	58	69	72	152	56	143	91	43
Ni	8	7	4	5	4	2	6	3	27	35	11	6	5	3	14	12
V	50	32	12	11	2	0	17	13	73	66	43	36	29	14	36	20
Cr	18	11	11	8	4	4	10	7	53	54	26	9	4	6	21	18
Ga	22	19	17	22	13	14	17	3	21	21	18	14	14	12	17	3
Sc	1	5	<1	1	<1	<1	2 (*n=9*)	2		10		6	2	1	5 (*n=7*)	3
Cs †		1.7	0.6	2.0	0.7	0.4	1.6	1.6	<0.2	<0.2	<0.2	<0.2			<0.2	0.1
Hf †		3.8	1.6	3.0	1.4	0.9	2.6	1.2	2.1	2.0	1.8	4.1			2.3	0.8
Sc †		4.1	2.4	1.9	0.8	1.6	2.8	1.5	9.3	8.2	5.5	4.4			7.3	2.5
Ta †		0.5	0.3	<0.3	0.5	0.9	0.4	0.3	0.4	<0.3	<0.3	<0.3			<0.3	<0.3
Th †		11.0	0.3	3.6	12.9	1.5	6.3	5.2	<0.2	<0.2	<0.2	<0.2			0.0	0.1
U †		1.0	<0.1	1.2	1.0	0.6	0.6	0.5	<0.1	<0.1	<0.1	0.4			0.1	0.2
La †		17.6	4.1	17.0	13.1	5.0	14.7	8.5	17.0	8.8	13.9	11.3			12.8	3.1
Ce †		47	6	26	24	6	26	15	33	15	22	16			22	7
Nd †		11	3	11	10	3	9	4	16	6	10	6			10	4
Sm †		1.91	0.52	1.60	1.14	0.31	1.39	0.65	3.10	1.24	1.77	0.83			1.78	0.80
Eu †		0.61	0.34	0.40	0.43	0.23	0.46	0.13	0.98	0.68	0.69	0.95			0.84	0.13
Tb †		0.2	0.1	<0.1	0.1	0.1	0.1	0.1	0.4	0.2	0.3	0.2			0.3	0.1
Yb †		0.44	0.18	0.33	0.18	0.13	0.36	0.26	0.80	0.47	0.38	0.71			0.67	0.29
Lu †		0.08	0.03	0.06	0.02	0.00	0.05	0.04	0.10	0.06	0.05	0.11			0.09	0.04

Representative samples and averages of all analyses. See Fig. 53 for sample localities.

Appendix 8. Chemical composition of retrogressed tonalitic-trondhjemitic grey gneiss, Fiskefjord area

GGU	Retrogressed									High P_2O_5, Sr, Ba, LREE								All retrogressed	
No	289247	289126	289246	289245	289130	339199	289243	average (n=82)	s.d.	328508	339941	328504	328538	339225	328523	average (*n=6*)	s.d.	average (*n=88*)	s.d.
SiO_2	64.58	66.71	68.33	70.04	70.59	72.57	74.52	70.26	2.87	64.62	65.36	66.84	67.80	68.49	69.67	67.13	1.91	70.05	2.91
TiO_2	0.45	0.29	0.40	0.31	0.15	0.13	0.15	0.28	0.14	0.38	0.34	0.32	0.33	0.30	0.24	0.32	0.05	0.28	0.13
Al_2O_3	17.99	17.07	16.31	16.15	16.18	15.86	14.24	15.97	1.05	16.03	16.11	16.57	16.58	16.67	16.19	16.36	0.28	15.99	1.02
Fe_2O_3	0.89	0.97	1.03	0.53	0.47	0.00	0.27	0.63	0.56	1.67	0.98	0.91	1.04	0.10	0.24	0.82	0.58	0.64	0.56
FeO	2.45	1.63	1.89	1.64	0.63	0.61	1.15	1.30	0.72	1.99	2.00	1.29	1.57	1.43	0.92	1.53	0.42	1.32	0.71
FeO*	3.25	2.50	2.82	2.12	1.05	0.61	1.39	1.87	1.09	3.49	2.88	2.11	2.51	1.52	1.14	2.27	0.87	1.90	1.08
MnO	0.05	0.03	0.05	0.04	0.01	0.02	0.03	0.03	0.02	0.09	0.08	0.04	0.05	0.03	0.03	0.05	0.03	0.03	0.02
MgO	1.71	1.32	1.13	0.94	0.50	0.38	0.58	0.75	0.45	1.63	2.10	1.62	1.53	1.02	0.81	1.45	0.47	0.80	0.48
CaO	4.83	3.25	4.31	3.93	2.26	2.99	3.08	3.16	0.84	3.69	3.18	3.42	3.23	3.38	2.63	3.26	0.35	3.17	0.81
Na_2O	5.21	5.59	5.17	5.24	5.43	5.49	4.66	5.03	0.59	4.92	5.00	5.77	5.06	5.68	5.35	5.30	0.36	5.05	0.58
K_2O	0.83	1.35	0.48	0.71	1.92	0.95	0.88	1.31	0.61	3.42	3.41	2.01	1.36	1.02	2.71	2.32	1.03	1.38	0.69
P_2O_5	0.10	0.16	0.12	0.07	0.04	0.07	0.06	0.10	0.06	0.24	0.26	0.22	0.19	0.17	0.13	0.20	0.05	0.10	0.06
l.o.i.	0.27	0.51	0.21	0.18	0.40	0.47	0.13	0.38	0.20	0.62	0.45	0.47	0.57	0.79	0.40	0.55	0.14	0.39	0.20
Sum	99.37	98.88	99.42	99.78	98.58	99.55	99.75	99.19	0.54	99.30	99.27	99.48	99.31	99.07	99.32	99.29	0.13	99.19	0.53
Rb	11	14	3	4	24	10	19	17	15	87	72	36	7	3	52	43	34	19	18
Ba	457	818	375	454	1430	369	616	747	424	1590	2000	1540	1330	1640	1850	1658	237	809	474
Pb	12	15	8	11	13	12	13	14	6	33	37	25	15	15	25	25	9	15	6
Sr	630	1050	558	683	922	654	496	662	244	1160	1130	1220	988	1020	1130	1108	88	692	262
La	11	39	13	13	13	6	10	16	11	35	67	44	26	21	20	36	18	17	12
Ce	15	65	16	19	23	14	16	26	19	68	131	79	47	35	31	65	37	29	23
Nd	8	25	6	8	9	5	5	11	7	32	54	33	22	14	11	28	16	12	9
Y	3	4	1	1	<1	1	2	3	4	15	15	6	3	1	2	7	6	3	4
Th	5	5	2	2	<1	1	1	3	3	8	16	7	1	<1	4	6	6	3	3
Zr	84	114	121	91	71	63	52	108	67	103	141	105	67	47	84	91	33	107	65
Nb	2.7	2.0	2.3	2.4	1.3	2.1	1.4	2.2	1.8	4.6	6.2	2.9	2.2	1.5	2.2	3.3	1.8	2.3	1.8
Zn	58	56	53	39	27	24	32	39	17	75	59	48	55	36	28	50	17	40	18
Cu	15	18	8	3	<1	8	9	8	8	16	21	15	15	17	23	18	3	9	8
Co	31	39	28	28	31	72	29	66	33	91	55	68	55	53	86	68	17	66	32
Ni	18	10	10	9	<1	3	2	6	5	11	28	27	17	7	9	17	9	6	6
V	51	30	33	21	12	7	13	23	14	67	48	36	44	30	21	41	16	24	15
Cr	19	8	16	7	4	12	5	9	8	14	40	31	27	8	13	22	12	9	9
Ga	19	21	17	18	20	15	15	18	2	24	21	19	20	16	18	20	3	18	2
Sc	5	3	3	2	<1	2	1	2	2	9	7	4	8	8	2	6	3	2	2
								(*n=8*)											
Cs †	0.5		<0.2	<0.2		<0.2	0.3	0.1	0.2										
Hf †	2.0		2.6	2.3		1.8	1.4	1.8	0.5										
Sc †	4.9		3.2	2.2		1.1	1.4	3.1	2.3										
Ta †	0.4		0.6	0.7		<0.3	0.8	0.5	0.3										
Th †	0.2		0.0	0.2		0.3	0.5	0.3	0.3										
U †	<0.1		<0.1	0.2		<0.1	<0.1	<0.1	0.1										
La †	12.7		12.7	14.7		7.6	13.4	12.2	2.3										
Ce †	20		18	19		12	17	17	4										
Nd †	8		7	6		4	5	6	3										
Sm †	1.30		0.87	0.77		0.66	0.69	0.94	0.57										
Eu †	0.68		0.64	0.71		0.36	0.64	0.66	0.18										
Tb †	0.1		0.1	0.1		0.1	0.1	0.1	0.1										
Yb †	0.27		0.19	0.20		0.09	0.15	0.21	0.14										
Lu †	0.04		0.02	0.03		0.02	0.03	0.03	0.02										

Representative samples and averages of ordinary retrogressed tonalitic-trondhjemitic grey gneiss and a group with high P_2O_5, Sr, Ba, LREE, etc. at central Fiskefjord, related to the Qeqertaussaq diorite (see the main text and Appendix 6). Sample localities shown in Fig. 53.

Appendix 9. Chemical compositions of Finnefjeld gneiss and Taserssuaq tonalite complexes, Fiskefjord area

GGU	Finnefjeld gneiss complex							Taserssuaq tonalite complex								Mafic enclaves (Taserssuaq)			
No	339643	339638	339633	339641	339650	average (n=34)	s.d.	288616	283372	283317	278811	289103	289208	average (*n=30*)	s.d.	283329	283381	average (n=5)	s.d.
SiO_2	61.89	64.20	66.89	69.40	74.12	68.63	4.22	57.96	62.74	67.53	70.62	72.30	74.08	67.53	5.17	49.95	54.62	52.87	2.12
TiO_2	0.79	0.72	0.47	0.44	0.28	0.40	0.21	0.30	0.49	0.36	0.29	0.34	0.15	0.43	0.20	1.39	0.85	0.88	0.35
Al_2O_3	16.30	16.33	16.07	15.52	13.99	15.68	1.10	15.97	19.11	16.77	14.94	13.45	13.45	15.69	1.99	16.59	17.69	15.41	4.26
Fe_2O_3	1.50	1.38	1.00	0.88	0.19	0.76	0.50	1.48	0.86	0.69	0.84	1.05	0.28	1.18	0.63	3.80	2.25	2.60	0.70
FeO	4.08	3.53	2.48	2.05	1.48	2.05	1.23	4.49	2.33	2.19	1.41	1.57	0.90	2.07	0.96	6.94	5.45	6.02	0.61
FeO*	5.43	4.77	3.38	2.84	1.65	2.73	1.65	5.82	3.10	2.81	2.17	2.52	1.15	3.13	1.41	10.36	7.48	8.36	1.19
MnO	0.09	0.08	0.06	0.05	0.03	0.05	0.03	0.12	0.05	0.05	0.03	0.05	0.04	0.06	0.03	0.16	0.13	0.14	0.02
MgO	2.84	1.74	1.52	1.23	0.69	1.29	0.96	6.03	1.72	1.39	0.54	0.71	0.26	1.31	1.09	4.72	4.08	6.25	3.42
CaO	3.98	4.14	3.68	3.38	2.69	3.24	1.20	6.14	5.18	3.80	2.40	1.83	0.80	3.17	1.54	8.27	7.40	8.85	1.86
Na_2O	4.23	4.90	4.63	4.59	4.99	4.51	0.65	3.90	5.53	4.72	4.11	3.73	3.69	4.39	0.70	3.72	4.20	3.36	1.34
K_2O	2.09	1.73	1.89	1.68	1.72	2.27	1.24	1.59	1.42	1.61	3.25	3.85	5.04	2.64	1.29	1.74	1.54	1.40	0.42
P_2O_5	0.22	0.26	0.18	0.16	0.10	0.15	0.07	0.04	0.09	0.10	0.10	0.10	0.03	0.14	0.09	0.54	0.33	0.33	0.17
l.o.i.	0.81	0.64	0.72	0.32	0.32	0.51	0.23	1.15	0.26	0.24	0.54	0.35	0.36	0.51	0.33	0.77	0.61	0.67	0.07
Sum	98.82	99.65	99.60	99.70	100.61	99.53	0.41	99.17	99.78	99.45	99.07	99.33	99.08	99.10	0.28	98.58	99.14	98.77	0.38
														(*n=17; Rb, Sr, Y, Zr, Nb: n=29*)					
Rb	66	47	46	43	38	57	25	62	45	77	76	81	141	73	40	47	46	37	12
Ba	1270	967	811	775	976	876	511		428	414	1010		427	677	387	624	770	463	238
Pb	11	12	15	13	14	18	7		16	15	13		19	17	4	8	6	8	2
Sr	519	323	388	359	360	462	199	437	540	466	420	187	65	396	202	721	704	597	240
La	20	21	81	14	14	20	14		9	19	30		44	39	30	63	43	45	19
Ce	46	38	47	25	28	39	20		15	32	34		87	74	62	113	81	82	37
Nd	24	18	23	10	11	18	10		9	17	17		35	29	21	49	38	39	15
Y	9	9	12	5	2	9	8	19	9	5	8	11	18	12	8	24	16	17	4
Th	2	<1	5	1	4	5	4		6	5	3		9	9	6	6	<1	4	3
Zr	187	217	153	116	126	121	47	62	94	79	102	195	108	154	98	100	99	90	23
Nb	5.2	4.9	4.8	4.5	3.3	4.3	2.6	5.9	6.2	3.2	4.6	7.6	5.9	5.8	3.4	11.0	5.9	6.3	3.2
Zn	90	82	70	59	38	53	26		47	57	39		39	59	23	121	88	93	20
Cu	20	22	14	7	7	13	8		3	11	10		5	11	8	62	15	70	71
Co	48	41	50	56	80	64	24		14	15	95		78	40	42	40	31	40	11
Ni	28	8	13	12	6	11	13		15	15	5		8	7	4	42	44	159	239
V	104	69	53	43	26	43	30		50	40	18		7	31	19	235	158	183	32
Cr	37	8	25	13	8	21	40		12	15	10		<1	7	4	19	24	152	264
Ga	22	19	21	18	15	18	3		23	18	17		16	19	4	20	21	18	5
Sc	11	20	13	5	2	7	7		5	4			5	6	4	21	17	26	13
						(*n=5*)								(*n=5*)				(*n=3*)	
Cs †	0.6	0.4	0.7	0.6	0.7	0.6	0.1		0.9	2.0	0.6		0.3	0.9	0.6	1.1	1.0	1.1	0.1
Hf †	5.1	5.3	4.5	2.9	2.2	4.0	1.4		3.0	2.4	2.0		3.3	2.7	0.5	3.0	2.9	3.0	0.2
Sc †	9.2	18.7	12.5	4.6	1.7	9.3	6.7		6.3	5.2	2.9		4.0	4.4	1.4	21.6	17.5	20.1	2.3
Ta †	<0.3	<0.3	0.4	<0.3	0.3	0.1	0.2		1.1	0.6	<0.3		0.4	0.5	0.4	0.6	0.3	0.5	0.2
Th †	1.7	0.6	2.6	1.0	2.3	1.6	0.8		1.5	3.3	3.2		8.1	4.2	2.5	5.5	2.5	4.1	1.5
U †	0.7	<0.1	<0.1	0.2	<0.1	0.2	0.3		0.9	0.6	0.7		0.4	0.6	0.2	0.3	0.5	0.7	0.5
La †	22.1	25.5	32.1	17.5	19.9	23.4	5.7		8.8	20.9	31.7		47.9	28.7	14.7	67.8	44.8	59.5	12.7
Ce †	38	44	53	31	29	39	10		17	36	49		89	49	27	124	81	107	23
Nd †	16	20	23	12	10	16	5		8	15	18		36	19	10	54	37	46	9
Sm †	2.66	3.09	3.83	1.80	1.04	2.48	1.09		2.25	1.95	2.62		6.01	3.06	1.67	8.08	5.87	7.11	1.13
Eu †	0.94	1.16	0.87	0.80	0.71	0.90	0.17		0.73	0.57	0.85		0.68	0.71	0.10	2.41	1.63	2.02	0.39
Tb †	0.4	0.3	0.4	0.2	0.1	0.3	0.1		0.3	0.2	0.3		0.7	0.3	0.3	0.9	0.6	0.7	0.2
Yb †	0.85	0.74	0.99	0.45	0.29	0.66	0.29		0.65	0.29	0.60		1.21	0.60	0.39	2.44	1.42	1.86	0.53
Lu †	0.11	0.10	0.13	0.07	0.05	0.09	0.03		0.07	0.04	0.09		0.15	0.07	0.05	0.28	0.19	0.23	0.05

Representative samples and averages of all analyses. See Fig. 68 for sample localities.

Appendix 10. Chemical compositions of Igánánguit granodiorite and Qugssuk granite, Fiskefjord area

GGU	Igánánguit granodiorite						Qugssuk granite					
No	278880	278883	278890	289059	average (*n=8*)	s. d.	289194	278786	283377	283378	average (*n=27*)	s. d.
SiO_2	67.04	69.40	69.89	70.83	70.04	2.27	70.58	75.30	77.50	78.29	73.69	2.38
TiO_2	0.41	0.25	0.39	0.28	0.29	0.12	0.27	0.10	0.15	0.14	0.17	0.07
Al_2O_3	16.98	15.97	15.21	15.36	15.54	0.79	15.43	13.30	12.08	11.73	14.08	1.43
Fe_2O_3	0.73	0.62	0.76	0.83	0.65	0.29	0.21	0.23	0.33	0.51	0.35	0.25
FeO	2.18	1.13	1.41	1.17	1.31	0.64	1.20	0.88	0.53	0.32	0.83	0.32
FeO*	2.84	1.69	2.09	1.92	1.89	0.87	1.39	1.09	0.83	0.78	1.41	0.39
MnO	0.04	0.03	0.03	0.02	0.03	0.01	0.01	0.01	0.02	0.02	0.02	0.01
MgO	1.09	0.70	0.84	0.62	0.73	0.35	0.58	0.05	0.05	0.05	0.30	0.19
CaO	3.44	2.49	2.33	2.12	2.32	0.75	1.97	1.22	0.61	0.58	1.56	0.66
Na_2O	5.34	4.93	4.78	4.71	4.73	0.40	3.85	3.24	2.91	2.86	3.64	0.77
K_2O	1.33	2.92	2.61	3.15	2.96	1.12	4.40	4.92	5.18	4.97	4.28	1.11
P_2O_5	0.15	0.21	0.16	0.11	0.14	0.05	0.09	0.01	0.02	0.02	0.04	0.03
l.o.i.	0.46	0.49	0.47	0.26	0.43	0.24	0.33	0.08	0.06	0.04	0.22	0.21
Sum	99.19	99.14	98.88	99.46	99.15	0.21	98.92	99.34	99.45	99.53	99.18	0.28
												(*n=16; Rb, Sr, Y, Th, Zr, Nb: n=25*)
Rb	48	54	78	44	70	22	83	135	142	133	105	32
Ba	317	1030	1630	1810	1183	507		777	287	197	1032	858
Pb	17	19	20	22	21	5		25	20	18	23	5
Sr	507	475	538	537	474	66	667	146	85	60	282	185
La	19	20	52	39	29	14		21	39	27	25	14
Ce	21	16	70	48	37	22		31	65	53	45	28
Nd	13	8	22	16	14	5		12	30	20	17	10
Y	5	3	4	2	4	2	3	3	11	10	6	7
Th	7	<1	15	12	9	6		12	12	14	12	6
Zr	99	84	258	148	138	62	136	113	93	90	118	43
Nb	4.9	1.8	3.9	1.9	3.2	1.6	2.0	1.4	3.5	4.3	3.4	2.5
Zn	60	30	45	33	36	17		16	11	10	20	10
Cu	37	8	9	8	10	11		3	7	<1	8	11
Co	92	106	71	95	97	21		233	22	17	42	59
Ni	3	4	5	4	4	2		4	4	<1	4	2
V	37	20	21	20	20	13		8	3	3	7	5
Cr	17	6	13	10	8	5		5	4	3	6	4
Ga	21	17	17	17	7	3		13	14	14	14	2
					(*n=6*)						(*n=5*)	
Cs †	0.8	0.2	0.4	<0.2	0.4	0.3	0.3	0.3	0.8		0.4	0.2
Hf †	2.7	1.5	5.6	3.6	3.2	1.5	2.8	2.3	3.5		3.0	0.8
Sc †	5.0	1.8	2.8	2.0	2.6	1.4	2.0	1.2	1.2		1.5	0.5
Ta †	0.6	0.4	<0.3	<0.3	0.3	0.3	<0.3	<0.3	0.6		0.1	0.3
Th †	9.6	0.7	14.2	14.0	11.2	6.5	9.1	13.4	9.2		12.3	3.3
U †	0.8	<0.1	0.8	<0.1	0.3	0.4	0.5	0.5	0.5		0.6	0.1
La †	28.4	20.1	77.4	62.9	48.4	23.8	38.6	33.9	43.3		45.2	10.2
Ce †	46	30	106	96	70	32	56	52	70		69	18
Nd †	19	12	29	30	22	7	17	17	29		24	7
Sm †	2.92	1.67	3.17	3.29	2.72	0.65	2.09	2.59	4.41		2.99	0.90
Eu †	0.59	0.79	0.84	0.96	0.78	0.14	0.74	0.56	0.40		0.61	0.14
Tb †	0.2	0.2	0.3	0.2	0.3	0.1	0.2	0.2	0.5		0.3	0.1
Yb †	0.38	0.28	0.47	0.25	0.34	0.09	0.25	0.33	0.69		0.37	0.18
Lu †	0.05	0.04	0.05	0.03	0.04	0.01	0.02	0.04	0.10		0.04	0.03

Representative samples and averages of all analyses belonging to Igánánguit granodiorite and Qugssuk granite (groups a and b in the main text). See Fig. 68 for sample localities.

Appendix 11. Chemical compositions of various granitic rocks, Fiskefjord area

GGU	Other granites (amphibolite facies)						Mesoperthite granite					
No	283664	283682	283686	283683	average (n=8)	s. d.	283715	289156	289159	289153	average (n=16)	s. d.
SiO_2	68.14	71.49	72.49	73.56	71.94	1.80	70.67	72.15	73.70	75.68	72.53	1.28
TiO_2	0.12	0.29	0.21	0.15	0.22	0.07	0.15	0.15	0.11	0.02	0.14	0.07
Al_2O_3	18.68	15.20	14.38	14.43	15.27	1.54	17.14	15.24	13.66	13.55	15.46	0.96
Fe_2O_3	0.15	0.24	0.34	0.38	0.43	0.44	0.00	0.48	0.41	0.15	0.21	0.19
FeO	0.40	1.37	1.08	0.66	1.05	0.41	0.65	0.48	0.88	0.34	0.59	0.27
FeO*	0.54	1.59	1.39	1.00	1.43	0.71	0.65	0.91	1.25	0.48	0.78	0.32
MnO	0.02	0.03	0.03	0.03	0.03	0.01	0.02	0.01	0.01	<0.01	0.02	0.01
MgO	0.32	0.77	0.47	0.32	0.48	0.18	0.25	0.37	0.36	0.06	0.32	0.14
CaO	3.39	2.92	1.77	1.26	2.17	0.71	2.27	1.83	1.06	1.62	1.93	0.38
Na_2O	5.88	4.00	3.42	3.62	4.09	0.84	6.17	5.13	3.16	2.71	4.94	1.07
K_2O	1.56	1.95	4.01	4.28	3.00	1.11	1.88	2.50	4.85	4.33	2.75	0.96
P_2O_5	0.03	0.11	0.08	0.06	0.08	0.03	0.05	0.04	0.05	0.01	0.06	0.03
l.o.i.	0.19	0.34	0.68	0.60	0.36	0.20	0.11	0.28	0.51	0.31	0.24	0.12
Sum	98.89	98.70	98.96	99.35	99.12	0.28	99.36	98.66	98.76	98.78	99.18	0.32
Rb	31	34	108	107	67	32	13	39	105	65	45	26
Ba	796	3620	1490	1130	1587	929	1830	980	1500	2470	1455	425
Pb	19	13	29	21	21	6	23	22	28	25	23	4
Sr	578	603	280	196	445	333	1151	800	381	396	792	253
La	10	28	48	22	27	15	9	13	34	9	13	7
Ce	24	51	94	48	52	24	17	22	53	3	22	13
Nd	8	17	33	17	19	8	7	9	21	4	9	5
Y	2	2	6	5	4	2	1	1	4	<1	1	1
Th	7	11	29	20	16	9	3	4	14	1	4	3
Zr	426	244	188	115	203	107	43	77	139	90	70	35
Nb	0.8	<0.8	3.3	2.2	2.0	1.4	0.8	1.0	1.3	0.8	1.0	0.7
Zn	15	28	36	19	28	8	18	32	26	3	27	14
Cu	8	21	5	8	9	6	14	2	4	<1	9	6
Co	41	40	77	43	61	24	101	51	74	134	94	29
Ni	6	8	4	4	5	2	2	5	7	5	4	2
V	7	26	14	9	15	6	7	8	15	9	9	4
Cr	3	12	14	8	10	5	8	4	4	<1	4	4
Ga	22	13	14	15	15	3	15	17	14	13	17	2
Sc	2	2	3	3	3	1	2	<1	<1	<1	1 (*n*=2)	1
Cs †							<0.2		<0.2			
Hf †							1.5		3.9		5.4	
Sc †							0.4		1.1		1.5	
Ta †							<0.3		<0.3			
Th †							0.2		14.9		15.1	
U †							<0.1		0.6			
La †							12.9		46.3		59.2	
Ce †							23		84		107	
Nd †							8		30		38	
Sm †							0.92		3.42		4.34	
Eu †							0.42		0.53		0.9	
Tb †							0.1		0.2		0.3	
Yb †							0.12		0.32		0.44	
Lu †							<0.03		0.05		0.05	

Representative samples and averages of all analyses belonging to amphibolite facies granite sheets in north-eastern Nordlandet (group c in the main text) and mesoperthite (granulite facies) granite sheets (group d). See Fig. 68 for sample localities.

Appendix 12. Chemical analyses of High-Mg and other dykes in the Fiskefjord area

GGU	High-Mg N-S dykes									Related N-S dykes			Microgranite dyke			
No	339196	339105	283629	339534	339148	328172	289116	328143	289155	289115	278778	278779	289229	289236	289271	average
	Pâkitsoq	Feeder	E Feeder	E Feeder	E Feeder	E Feeder	W Sister	W Sister	E Sister	NW of Usuk	Narssarssuaq			Qugssuk		
SiO_2	53.21	52.34	51.91	51.55	52.00	51.34	53.70	53.79	50.86	56.51	56.80	56.51	69.19	69.25	68.91	69.12
TiO_2	0.46	0.42	0.34	0.40	0.39	0.54	0.46	0.47	0.50	0.57	0.59	0.58	0.56	0.54	0.58	0.56
Al_2O_3	10.95	12.31	8.85	10.29	9.98	8.52	10.97	11.47	8.35	14.82	14.74	14.73	14.45	14.42	14.38	14.42
Fe_2O_3	2.58	2.66	2.34	3.13	2.18	2.11	2.44	2.31	2.22	2.01	0.87	1.33	1.12	1.01	1.21	1.11
FeO	7.02	6.39	6.72	6.03	6.97	7.95	7.50	7.31	7.95	6.65	8.15	7.75	1.96	1.97	1.97	1.97
FeO*	9.34	8.78	8.83	8.85	8.93	9.85	9.70	9.39	9.95	8.46	8.93	8.95	2.97	2.88	3.06	2.97
MnO	0.17	0.15	0.17	0.16	0.16	0.18	0.16	0.17	0.16	0.14	0.14	0.14	0.04	0.04	0.04	0.04
MgO	14.74	13.70	21.08	18.49	17.84	17.27	13.30	12.79	18.31	6.29	4.97	4.98	0.69	0.66	0.65	0.67
CaO	7.30	8.21	5.93	6.82	6.77	7.83	7.49	7.77	7.04	8.29	8.59	8.59	1.96	1.97	1.97	1.97
Na_2O	1.85	2.13	1.45	1.83	1.75	1.74	1.99	1.96	1.72	2.62	3.02	2.83	3.61	3.66	3.26	3.51
K_2O	0.77	0.63	0.50	0.55	0.59	0.59	0.69	0.73	0.59	0.99	1.29	1.25	4.86	4.84	4.92	4.87
P_2O_5	0.11	0.11	0.08	0.10	0.10	0.08	0.09	0.10	0.07	0.10	0.12	0.11	0.14	0.14	0.16	0.15
l.o.i.	1.18	1.23	0.79	0.84	1.33	1.29	1.20	1.22	1.44	0.88	0.76	1.00	0.22	0.22	0.22	0.22
Sum	100.34	100.28	100.15	100.20	100.06	99.44	99.99	100.10	99.21	99.87	100.04	99.80	98.81	98.70	98.27	98.61
Rb	23	13	13	13	15		20		18	28	40	39	251	256	212	240
Ba	325	317	251	280	260		314		239	378	427	437	1280	1260	1570	1370
Pb	7	6	2	4	6		3		4	5	2	4	27	27	20	25
Sr	255	248	155	192	180		248		198	312	314	318	270	280	283	278
La	13	13	11	11	9		21		13	17	19	14	150	142	141	144
Ce	26	21	15	15	17		23		16	29	26	38	294	279	274	282
Nd	13	9	6	7	8		11		8	14	15	21	110	102	103	105
Y	10	9	8	10	9		12		9	14	15	14	44	41	43	43
Th	3	1	2	2	4		<1		3	4	2	3	33	36	31	33
Zr	61	61	51	59	60		64		58	82	94	93	481	473	526	493
Nb	3.0	3.5	1.3	2.9	2.7		3.4		3.0	4.3	4.7	4.2	22.0	22.0	24.0	22.7
Zn	98	75	69	72	77		76		72	67	77	75	42	30	43	38
Cu	56	40	46	32	34		58		801	60	52	55	2	11	14	9
Co	77	69	17	88	88		74		94	60	116	94	19	15	19	18
Ni	456	479	934	738	698		274		69	62	60	65	10	9	15	11
V	165	152	131	144	143		166		151	158	165	170	32	33	32	32
Cr	1730	1460	2860	2270	2450		1300		3220	226	86	89	11	10	10	10
Ga	15	17	11	13	12		16		13	21	20	21	20	22	21	21
Sc	28	26	22	21	26		24		19	23			3	3	4	3
Cs †													<2	<2		<2
Hf †													14	15		14.5
Sc †													4.2	4.6		4.4
Ta †													<3	<3		<3
Th †													24	28		26
U †													2.7	2.5		2.6
La †													170	170		170
Ce †													280	290		285
Nd †													100	100		100
Sm †													12	12		12
Eu †													1.6	1.6		1.6
Tb †													1.4	1.6		1.5
Yb †													3.44	3.40		3.42
Lu †													0.45	0.43		0.44

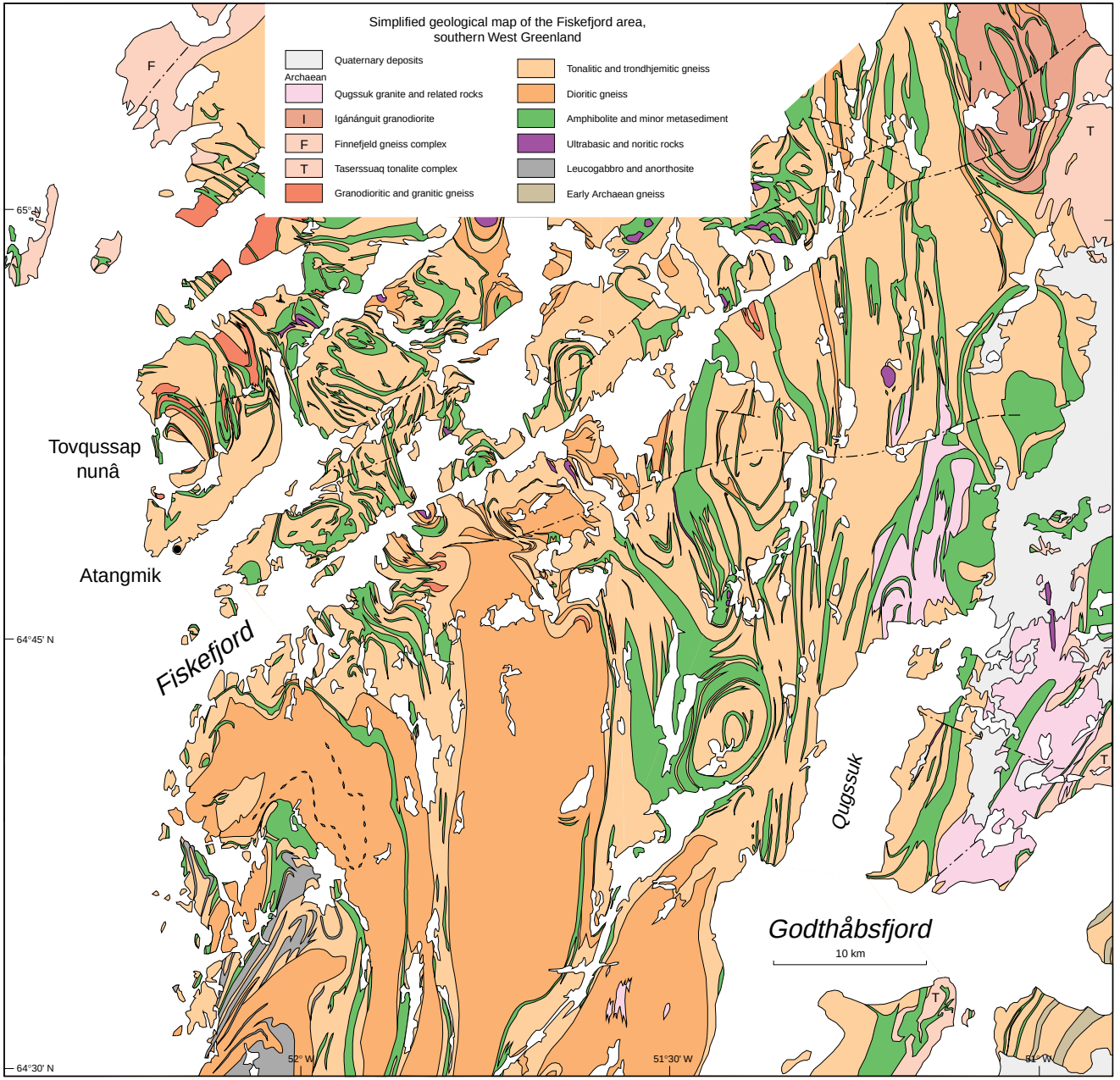
Dyke names by Berthelsen & Bridgwater (1960) are used where appropriate, or the nearest place name (Fig. 1) is indicated. Locations of samples are shown in Fig. 82.

Appendix 13. Chemical analyses of NE–SW and E–W trending mafic dykes in the Fiskefjord area

GGU	NE-SW dykes								E-W dykes							
No	328228	328229	328151	278836	283622	328147	278812	289093	278713	289092	328219	278810	289112	283384	283390	283394
	Kangeq	Eqaluk	Blåbær		Fiskefjord		Narssarssuaq		Inner Fiskefjord		S Kangeq	Qugssuk	NofUsuk		Tasiussaq	
SiO_2	51.44	51.07	53.18	52.92	49.24	49.62	53.34	52.67	50.11	49.64	49.99	50.15	50.97	50.30	49.95	50.10
TiO_2	1.05	0.88	2.21	2.37	1.59	1.37	0.62	0.60	1.74	1.49	1.56	1.00	1.11	2.25	2.08	2.27
Al_2O_3	9.25	7.99	13.73	13.13	14.50	14.05	13.41	13.80	12.70	12.82	13.46	14.33	14.23	12.69	12.80	12.65
Fe_2O_3	2.37	2.38	3.81	4.56	3.47	3.20	2.29	1.55	3.37	2.33	2.66	1.95	2.63	2.55	1.91	2.36
FeO	9.65	9.31	9.95	10.43	11.21	11.22	7.61	7.57	12.31	12.14	11.90	10.18	10.63	13.94	14.14	14.28
FeO*	11.78	11.45	13.38	14.53	14.33	14.10	9.67	8.97	15.34	14.24	14.29	11.94	13.00	16.24	15.86	16.40
MnO	0.19	0.20	0.18	0.19	0.21	0.22	0.16	0.16	0.23	0.23	0.23	0.21	0.21	0.25	0.25	0.25
MgO	10.89	13.62	3.61	3.71	6.03	7.32	9.81	8.75	5.63	6.31	5.96	6.63	6.09	5.01	5.52	4.91
CaO	10.17	10.49	7.70	7.69	9.13	8.69	9.23	10.08	9.68	10.05	9.72	11.71	10.27	9.26	9.47	9.16
Na_2O	2.38	1.96	2.50	2.61	2.35	2.14	1.99	1.94	2.29	2.13	1.99	1.87	2.23	2.36	2.34	2.30
K_2O	1.01	0.74	1.09	1.00	0.59	0.48	0.52	0.48	0.61	0.63	0.56	0.28	0.52	0.90	0.77	0.93
P_2O_5	0.15	0.12	0.49	0.50	0.28	0.22	0.08	0.08	0.17	0.15	0.16	0.07	0.14	0.25	0.21	0.25
l.o.i.	1.08	1.23	1.11	1.07	1.42	1.32	0.98	2.06	1.43	1.73	1.28	1.78	1.03	1.55	1.57	1.59
Sum	99.63	99.98	99.56	100.18	100.02	99.84	100.04	99.74	100.27	99.65	99.48	100.16	100.06	101.31	101.01	101.04
Rb				19			12	12	15	17		11	12			
Ba				523			238	243	300	224		70	252			
Pb				3			1	4	<1	2		<1	4			
Sr				380			204	192	199	198		120	227			
La				31			16	16	11	14		1	12			
Ce				57			18	23	23	24		3	18			
Nd				37			11	11	16	16		11	13			
Y				33			15	15	29	25		22	21			
Th				2			3	3	<1	2		<1	3			
Zr				166			65	67	106	89		59	70			
Nb				7.3			2.9	3.8	9.1	6.9		3.9	5.6			
Zn				156			80	77	124	118		106	89			
Cu				21			86	99	192	391		94	89			
Co				78			78	57	71	77		86	69			
Ni				38			194	174	61	71		60	46			
V				383			194	192	412	377		291	289			
Cr				39			676	490	89	135		160	97			
Ga				26			17	15	19	17		19	20			
Sc							28	30		42			35			

Dyke names by Berthelsen & Bridgwater (1960) are used where appropriate, or the nearest place name (Fig. 1) is indicated. Locations of samples are shown in Fig. 82.

Plate 1 (In pocket). Simplified geological map of the Fiskefjord area.


Simplified geological map of the Fiskefjord area,
southern West Greenland
Quaternary deposits
Archaean
Qugssuk granite and related rocks
Igánánguit granodiorite
Finnefjeld gneiss complex
Taserssuaq tonalite complex
Granodioritic and granitic gneiss
Tonalitic and trondhjemitic gneiss
Dioritic gneiss
Amphibolite and minor metasediment
Ultrabasic and noritic rocks
Leucogabbro and anorthosite
Early Archaean gneiss
F
I
T
65° N
Tovqussap
nunâ
Atangmik
64°45' N
Fiskefjord
Qugssuk
Godthåbsfjord
10 km
64°30' N
52° W
51°30' W
51° W