

Supplement S6

Tab. S6 Representative microprobe analyses of biotite to phlogopite (wt. %) with formulas calculated to 22 atoms of oxygen

Rock	Melteigite		Ijolite		Urtite		Essexite	
Sample	DH1330		DH1319B and DH1329		DR051B		DR052	
n	15		25		6		12	
Variety	mg# max	mg# min	mg# max	mg# min	mg# max	mg# min	mg# max	mg# min
SiO ₂	40.95	35.36	34.72	34.31	39.91	34.64	36.48	34.93
TiO ₂	0.35	9.55	8.64	8.68	3.44	7.11	6.52	8.76
Al ₂ O ₃	13.51	14.02	14.81	14.07	11.07	13.79	14.68	13.37
Cr ₂ O ₃	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
FeO	5.06	14.70	13.38	17.80	7.95	16.84	8.70	17.54
MnO	0.05	0.17	0.12	0.20	0.30	0.64	0.02	0.30
MgO	24.89	12.80	13.26	10.46	21.01	12.48	17.55	10.63
CaO	0.03	0.02	0.00	0.02	0.08	0.05	0.06	0.01
BaO	0.02	2.62	2.64	2.46	0.41	0.83	0.17	0.62
Na ₂ O	0.36	0.47	0.54	0.48	0.28	0.36	0.93	0.55
K ₂ O	10.46	8.46	8.56	8.04	9.90	9.21	8.86	8.85
F	2.64	1.28	0.98	1.00	2.51	1.66	0.69	0.84
Cl	0.06	0.03	0.02	0.01	0.01	0.01	0.03	0.02
Total	98.37	99.46	97.66	97.53	96.87	97.63	94.70	96.43
Si	5.82	5.25	5.21	5.25	5.87	5.29	5.39	5.34
Ti	0.04	1.07	0.97	1.00	0.38	0.82	0.72	1.01
Al	2.26	2.45	2.62	2.54	1.92	2.48	2.56	2.41
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe	0.60	1.82	1.68	2.28	0.98	2.15	1.08	2.24
Mn	0.01	0.02	0.02	0.03	0.04	0.08	0.00	0.04
Mg	5.28	2.83	2.96	2.39	4.61	2.84	3.87	2.42
Ca	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00
Ba	0.00	0.15	0.16	0.15	0.02	0.05	0.01	0.04
Na	0.10	0.14	0.16	0.14	0.08	0.11	0.27	0.16
K	1.90	1.60	1.64	1.57	1.86	1.79	1.67	1.73
Σ cations	16.01	15.33	15.41	15.34	15.76	15.61	15.57	15.39
O	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00
F	1.19	0.60	0.46	0.48	1.17	0.80	0.32	0.41
Cl	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01
mg#	0.90	0.61	0.64	0.51	0.82	0.57	0.78	0.52

$$\text{mg\#} = \text{Mg}/(\text{Mg} + \text{Fe}_{\text{tot}})$$

Rock	Sodalite monzosyenite		Trachyte (dyke)		Pseudolamprophyre	
Sample	DH 1322		DB2/18.2m		DH1321	
n	8		8		18	
Variety	mg# max	mg# min	mg# max	mg# min	mg# max	mg# min
SiO ₂	35.79	35.64	35.70	35.58	37.32	35.38
TiO ₂	5.41	4.49	5.45	5.65	5.10	8.94
Al ₂ O ₃	14.53	14.42	14.81	14.38	15.50	14.56
Cr ₂ O ₃	0.00	0.00	0.00	0.00	0.21	0.10
FeO	12.36	17.45	9.77	10.45	9.06	12.86
MnO	0.62	0.92	0.41	0.28	0.15	0.15
MgO	15.90	12.49	17.20	16.35	18.44	14.21
CaO	0.00	0.00	0.01	0.07	0.03	0.03
BaO	0.77	0.28	0.86	0.89	0.26	0.34
Na ₂ O	0.35	0.19	0.66	0.40	0.37	0.28
K ₂ O	9.54	9.62	9.08	9.30	9.48	9.80
F	2.12	1.15	2.05	1.82	0.88	0.49
Cl	0.01	0.02	0.05	0.04	0.01	0.02
Total	97.40	96.66	96.06	95.22	96.82	97.16
Si	5.37	5.45	5.35	5.39	5.41	5.23
Ti	0.61	0.52	0.61	0.64	0.56	0.99
Al	2.57	2.60	2.62	2.57	2.65	2.54
Cr	0.00	0.00	0.00	0.00	0.02	0.01
Fe	1.55	2.23	1.23	1.32	1.10	1.59
Mn	0.08	0.12	0.05	0.04	0.02	0.02
Mg	3.55	2.84	3.85	3.69	3.99	3.13
Ca	0.00	0.00	0.00	0.01	0.00	0.01
Ba	0.05	0.02	0.05	0.05	0.01	0.02
Na	0.10	0.06	0.19	0.12	0.10	0.08
K	1.83	1.87	1.74	1.80	1.75	1.85
Σ cations	15.70	15.70	15.69	15.64	15.62	15.47
O	22.00	22.00	22.00	22.00	22.00	22.00
F	1.01	0.55	0.97	0.87	0.40	0.23
Cl	0.00	0.00	0.01	0.01	0.00	0.01
mg#	0.70	0.56	0.76	0.74	0.78	0.66

$$\text{mg\#} = \text{Mg}/(\text{Mg} + \text{Fe}_{\text{tot}})$$

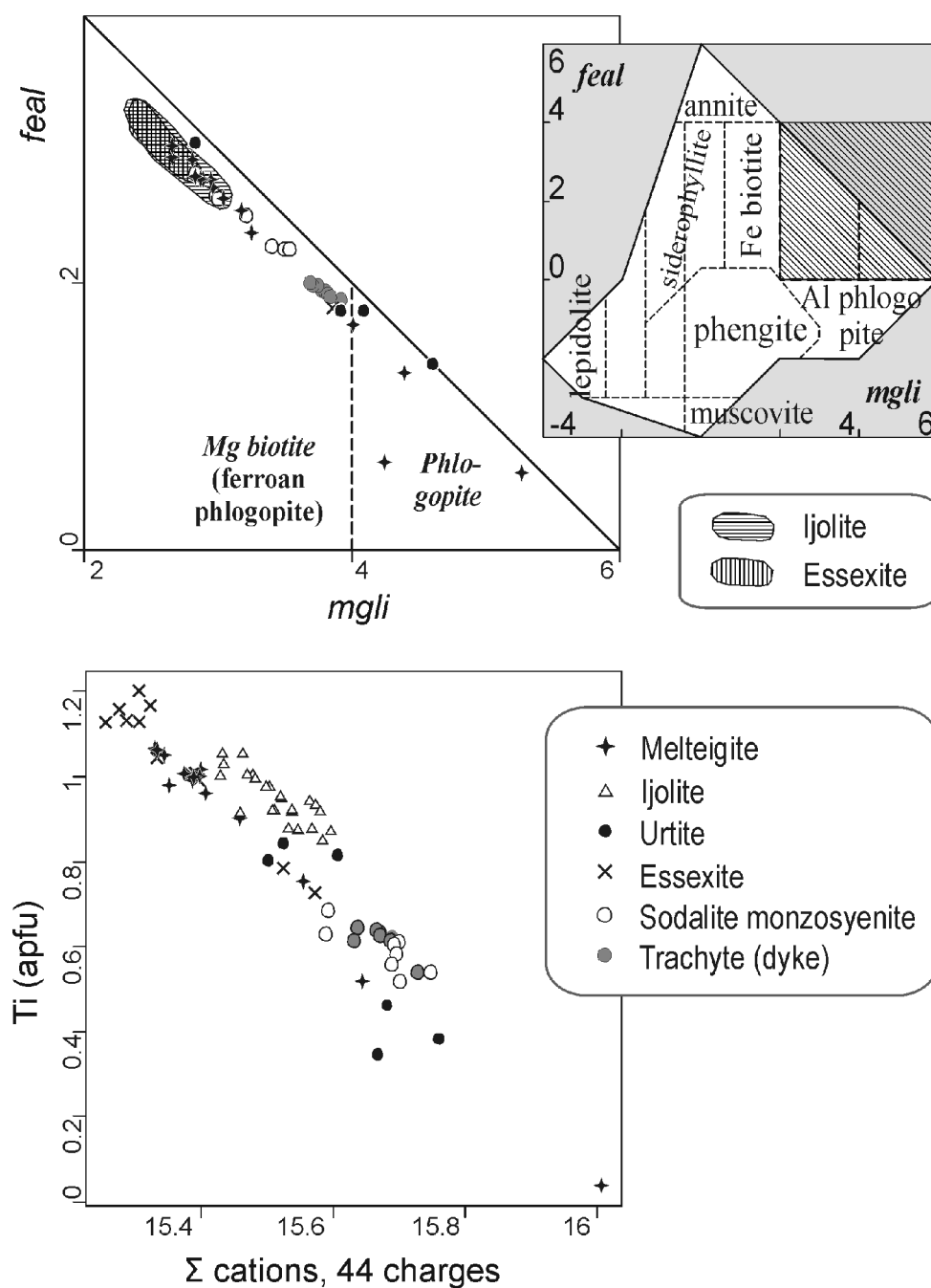


Fig. S6 Compositional variations of biotite micas from various intrusive rocks of the Doupov Intrusive Complex. Classification scheme and terminology are from Tischendorf et al. (2001). $feal$ = octahedral ($Fe_{tot} + Mn + Ti - Al^{VI}$); $mgli$ = octahedral ($Mg - Li$).