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Title of article Partial fusion along the Alpine fault zone

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Contents 4 p.

GSA Depository # 76-15

APPENDIX I. Analytical procedure

Analyses were performed on an electron microprobe with a beam diameter of 20 microns; a specimen current of 0.03 micro amps; using an accelerating voltage of 15 kv. Counts were accumulated for ten seconds with standards of hematite (FeO), periclase (MgO), wollastonite (SiO_2, CaO), albite (Na_2O), adularia (K_2O), manganosite (MnO), corundum (Al_2O_3), and rutile (TiO_2) using the Bence and Albee (1968), Albee and Ray (1970) and Sweatman and Long (1969) data reduction methods and corrections.

Difficulty was encountered in the stability of soda under the electron beam (see also Borom and Haunemann, 1967; Busch and others, 1974). Tests with a beam diameter of 2-3 microns; 10 seconds counting time with approximately 4 seconds between counts and a stationary beam showed successive losses in counts of 36%, 21%, 11% between the first four count times over approximately 52 seconds. During the same time silica showed a variation of $\pm$ 3% on the mean. Using the defocussed beam, analysing soda first and ensuring that the beam was only positioned on the glass immediately prior to counting reduced this error to within the natural limits of machine and sample.

Table 1. Analyses of ultramylonite and hyalomylonite from the Alpine Fault Zone and from the Himalayas

Sample	46A hy	46B hy	54A dou	54B lou	54C mu	55A dou	55B lou	55C mu	A hy	B hy
SiO_2	62.2	67.2	46.0	43.4	56.4	49.2	45.6	56.1	60.3	64.3
Al_2O_3	15.8	14.5	20.3	17.7	14.40	20.1	18.0	14.48	17.6	18.0
TiO_2	0.98	0.92	1.64	1.18	1.37	1.60	1.45	1.46	0.82	0.23
FeO*	7.42	6.53	10.91	14.23	8.83	11.67	12.83	8.83	5.34	2.85
MnO	0.19	0.11	0.28	0.22	0.13	0.18	0.21	0.14	0.06	0.04
MgO	2.05	1.75	4.63	0.87	4.20	4.74	7.07	4.17	2.06	1.03
CaO	4.37	3.62	6.30	3.51	5.59	5.65	8.19	5.27	1.73	1.60
Na_2O	2.17	1.79	3.51	2.86	0.78	3.76	3.07	0.80	2.63	2.86
K_2O	2.42	2.00	1.64	1.70	6.91	1.95	1.28	7.42	4.50	5.25
	97.6	98.4	95.2	94.7	98.6	98.8	97.7	98.7	94.8	95.9

* Total iron as FeO,

hy Hyalomylonite,

dou Dark brown opaque ultramylonite,

lou Light brown opaque ultramylonite,

mu Microlitic ultramylonite.

Samples 46, 54 and 55 are from the Alpine Fault Zone; samples A and B are the darker and lighter Himalayan hyalomylonite respectively.

46A is an hyalomylonite analysis that best represents the average of 15 analyses.

46B is optically identical to 46A but has a significantly different composition.

TABLE 2. RELATIONSHIP MEASURED IN BARS BETWEEN STRESS AND DISPLACEMENT FOR MOVEMENTS ON THE ALPINE FAULT

D*	$\sigma^{\dagger}$	$\sigma_f^{\S}$	$\sigma_o^{\#}$
30	210-20	40-150	250
100	110-15	30-90	140
300	80-10	20-90	100
600	75-5	15-40	90

Note: Variation in σ and σ_f result from frictional stresses taken as varying proportions of total stress.

* D is displacement on the fault in centimetres.
† $\sigma = \sigma_o - \sigma_f$.
§ σ_f is frictional shearing stress (bars).
# σ_o is total shearing stress (bars).

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