

Supplementary Materials

to

Amphibole fractionation and its potential redox effect on arc crust: Evidence from the Kohistan arc cumulates

Supplementary Figure

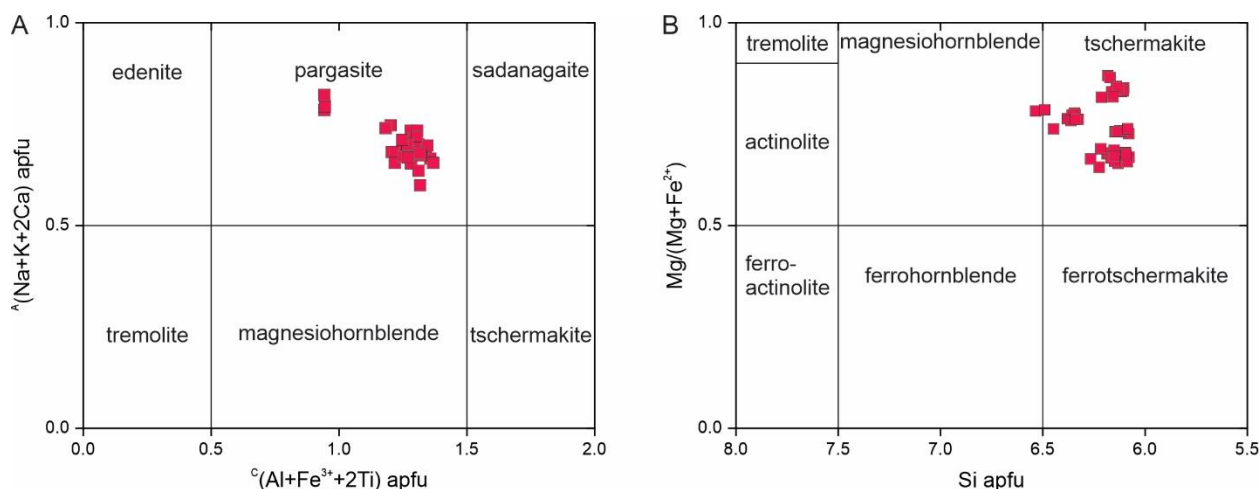


Figure S1 Classification of amphibole in the Kohistan cumulates. Diagrams are after Hawthorne et al. (2012) and Leak et al. (1997), respectively.

References

- Hawthorne, F.C., Oberti, R., Harlow, G.E., Maresch, W.V., Martin, R.F., Schumacher, J.C., and Welch, M.D. (2012) Nomenclature of the amphibole supergroup. *American Mineralogist*, 97, 2031-2048.
- Leake, B.E., Woolley, A.R., Arps, C.E.S., Birch, W.D., Gilbert, M.C., Grice, J.D., Hawthorne, F.C. (1997) Nomenclature of amphibole: Report of the subcommittee on amphiboles of the International Mineralogical Association, commission on new minerals and mineral names. *American Mineralogist*, 82, 1019-1037.

Supplementary Table

Table S1 Fitting parameters of Mössbauer spectroscopy.

Sample name	doublet 1			doublet 2			doublet 3		
	isomer shift	Q. splitting	area (%)	isomer shift	Q. splitting	area (%)	isomer shift	Q. splitting	area (%)
18JL040-grt	1.28307	3.54226	91.62	0.30906	0.39372	8.38			
18JL023-grt	1.29040	3.52694	70.98	1.23171	3.64270	21.04	0.30700	0.45059	7.99
18JL021-grt	1.02220	4.06401	1.50	1.28243	3.54438	90.99	0.28299	0.47213	7.51
18JL019-grt	1.28277	3.54556	92.67	0.30423	0.35625	7.33			
18JL040-amp	1.12291	2.67129	50.90	1.03633	2.02616	26.35	0.41292	0.50946	22.75
18JL023-amp	1.17985	2.46111	46.86	1.12190	1.88320	17.94	0.26853	0.92610	35.20
18JL029-amp	1.16905	2.52488	55.23	1.12255	1.89256	16.83	0.25176	0.96121	27.95

Table S2 Major elements compositions of amphibole in the Kohistan cumulates (wt%).

	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Cr ₂ O ₃	Na ₂ O	K ₂ O	P ₂ O ₅	F	Cl	Total
18JL020-01	44.98	0.98	14.35	9.05	0.05	14.30	11.39	0.10	2.35	0.21	0.00	0.00	0.01	97.77
18JL020-02	44.58	0.96	14.73	8.88	0.04	14.61	11.53	0.15	2.53	0.21	0.01	0.00	0.01	98.23
18JL020-03	45.79	0.85	13.26	8.73	0.08	14.89	11.47	0.13	2.25	0.15	0.02	0.00	0.01	97.62
18JL020-04	44.76	1.17	14.06	9.43	0.11	14.50	11.64	0.11	2.40	0.17	0.03	0.00	0.00	98.36
18JL020-05	44.56	0.93	14.63	8.99	0.07	14.62	11.74	0.13	2.50	0.20	0.00	0.00	0.01	98.38
18JL020-06	44.51	1.12	14.14	9.01	0.05	14.73	11.65	0.12	2.61	0.20	0.00	0.00	0.01	98.16
18JL023-01	42.13	1.08	17.05	10.05	0.04	12.93	11.42	0.00	2.80	0.21	0.00	0.00	0.01	97.71
18JL023-02	42.79	0.96	16.64	9.86	0.03	13.18	11.55	0.02	2.75	0.21	0.03	0.00	0.02	98.03
18JL023-03	42.88	1.22	17.01	9.67	0.02	13.21	11.71	0.02	2.81	0.21	0.02	0.00	0.02	98.76
18JL023-04	42.53	1.22	16.50	9.55	0.05	13.10	11.47	0.02	2.83	0.21	0.00	0.00	0.02	97.48
18JL023-05	42.55	1.10	16.54	9.86	0.02	13.27	11.54	0.03	2.80	0.21	0.02	0.00	0.00	97.94
18JL023-06	45.78	0.82	14.18	8.06	0.04	14.88	11.75	0.00	2.42	0.19	0.00	0.00	0.00	98.12
18JL023-07	42.52	1.21	16.63	9.62	0.02	13.08	11.32	0.02	2.95	0.21	0.00	0.00	0.01	97.58
18JL023-08	42.38	1.21	16.85	9.79	0.02	13.31	11.46	0.02	2.83	0.22	0.01	0.00	0.01	98.10
18JL029-01	42.54	1.28	15.69	11.51	0.05	12.25	11.58	0.00	2.55	0.31	0.00	0.00	0.01	97.77
18JL029-02	42.22	1.06	16.48	11.88	0.05	11.96	11.22	0.00	2.74	0.26	0.03	0.00	0.02	97.92
18JL029-03	42.01	1.37	14.97	11.92	0.07	11.57	11.66	0.00	2.58	0.29	0.02	0.00	0.02	96.48
18JL029-04	42.13	1.36	16.14	12.06	0.04	11.99	11.30	0.01	2.80	0.29	0.00	0.00	0.00	98.12
18JL029-05	42.39	1.28	15.82	11.84	0.03	12.32	11.59	0.02	2.40	0.31	0.00	0.00	0.02	98.01
18JL029-06	42.63	1.31	15.54	11.77	0.05	12.42	11.41	0.01	2.74	0.30	0.01	0.00	0.01	98.18
18JL029-07	41.81	1.50	16.18	12.17	0.03	12.02	11.46	0.04	2.46	0.35	0.01	0.00	0.03	98.05
18JL030-02	41.90	1.22	15.75	12.24	0.05	12.27	11.04	0.01	2.76	0.29	0.00	0.00	0.02	97.53
18JL030-03	42.34	1.00	15.46	11.87	0.03	12.68	11.49	0.03	2.84	0.29	0.01	0.00	0.01	98.04
18JL030-04	41.94	1.22	15.81	12.14	0.05	11.95	11.15	0.04	2.81	0.29	0.01	0.00	0.02	97.42
18JL030-05	41.92	1.32	15.88	12.26	0.02	12.10	11.26	0.02	2.90	0.28	0.00	0.00	0.02	97.98
18JL030-06	41.80	1.32	15.61	12.48	0.05	11.78	11.18	0.01	2.91	0.31	0.00	0.12	0.02	97.53
18JL030-07	41.53	1.31	15.95	12.44	0.05	11.82	11.27	0.01	2.85	0.29	0.02	0.00	0.01	97.55
18JL030-10	41.70	1.10	16.22	11.94	0.05	12.13	11.08	0.02	2.77	0.30	0.02	0.00	0.01	97.33
18JL030-11	42.86	0.77	15.48	11.83	0.03	12.62	11.29	0.01	2.67	0.29	0.02	0.02	0.01	97.88
18JL030-12	42.61	1.21	15.70	12.33	0.04	12.17	11.20	0.02	2.93	0.29	0.00	0.00	0.02	98.50
18JL030-13	41.67	1.09	15.80	12.02	0.05	11.70	11.22	0.02	2.75	0.30	0.02	0.00	0.02	96.64
18JL031-04	42.49	0.97	16.45	11.66	0.06	11.78	11.41	0.02	2.37	0.19	0.01	0.00	0.02	97.42
18JL031-05	42.36	0.95	16.39	11.84	0.04	12.04	11.23	0.00	2.50	0.23	0.01	0.00	0.02	97.61
18JL031-06	42.96	0.69	15.96	11.94	0.11	11.69	11.06	0.02	2.62	0.23	0.00	0.09	0.02	97.33
18JL031-07	42.32	0.69	16.65	11.75	0.06	11.89	11.26	0.01	2.79	0.21	0.03	0.00	0.02	97.70
18JL031-08	41.79	0.58	16.77	11.97	0.05	12.00	11.30	0.03	2.81	0.23	0.00	0.00	0.02	97.55
18JL15-01-1	43.30	0.54	14.34	8.54	0.06	15.94	12.04	\	2.60	0.25	\	0.00	0.01	97.62
18JL15-01-2	43.19	0.54	14.28	8.59	0.06	16.03	11.91	\	2.87	0.22	\	0.00	0.00	97.69
18JL15-02-1	42.53	0.82	15.08	9.06	0.05	15.16	11.85	\	2.69	0.20	\	0.00	0.00	97.45
18JL15-02-2	42.84	0.61	14.95	8.94	0.03	15.33	11.90	\	2.68	0.23	\	0.00	0.02	97.51

	SiO ₂	TiO ₂	Al ₂ O ₃	FeO	MnO	MgO	CaO	Cr ₂ O ₃	Na ₂ O	K ₂ O	P ₂ O ₅	F	Cl	Total
18JL15-03-1	43.28	0.86	14.53	9.07	0.02	15.05	11.97	\	2.52	0.21	\	0.00	0.00	97.51
18JL15-03-2	43.19	0.86	14.78	9.09	0.07	15.22	12.06	\	2.56	0.24	\	0.00	0.01	98.08
18JL15-04-1	42.89	0.62	15.31	9.25	0.05	15.10	12.08	\	2.70	0.20	\	0.00	0.01	98.20
18JL15-04-2	42.55	0.78	15.24	9.27	0.07	14.96	11.80	\	2.65	0.21	\	0.00	0.02	97.53
18JL15-04-3	42.62	0.62	15.00	8.88	0.05	15.22	11.86	\	2.74	0.21	\	0.00	0.01	97.21
18JL15-04-4	42.74	0.72	15.19	9.03	0.06	14.77	11.80	\	2.59	0.21	\	0.00	0.02	97.13