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esmaili@khayam.ut.ac.ir :

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Rb Zr Ba FeO K₂O Sc V Sr P₂O₅ TiO₂ MgO CaO N₂O

XRD

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ICP MS ICP

S.G.S.

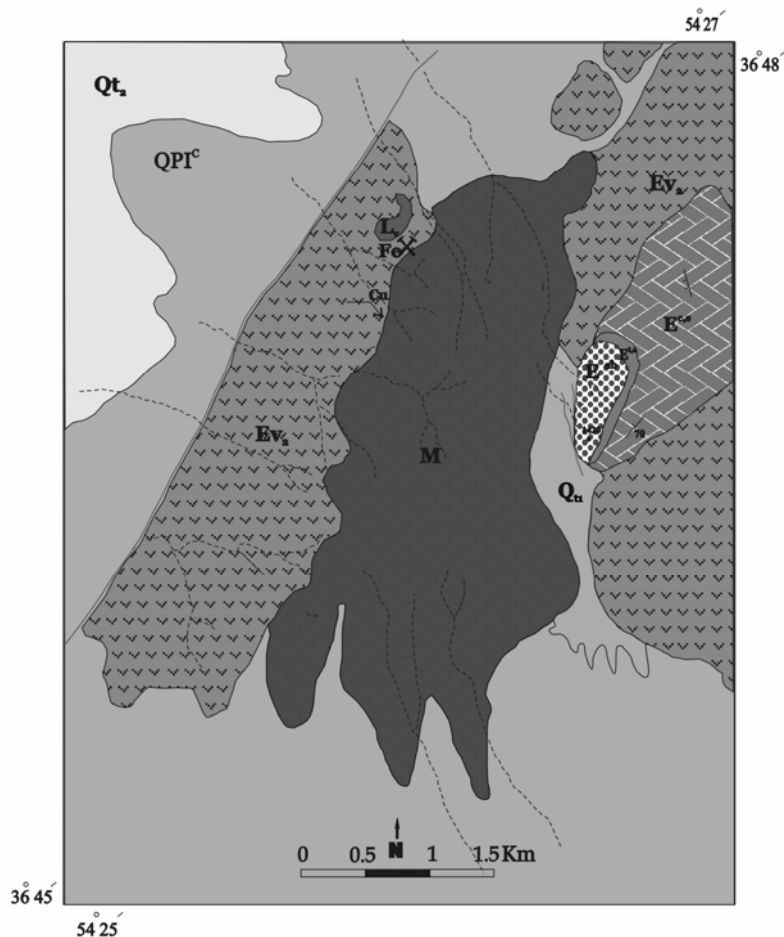
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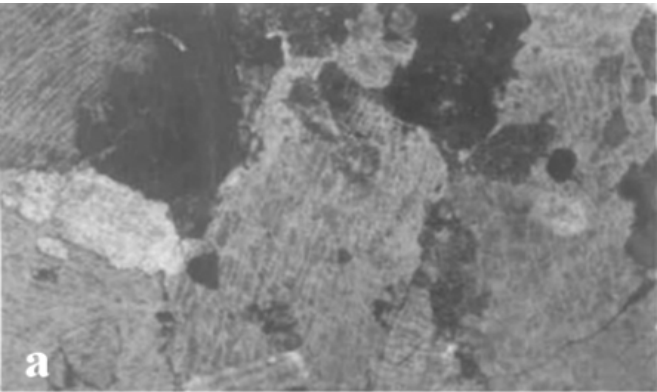
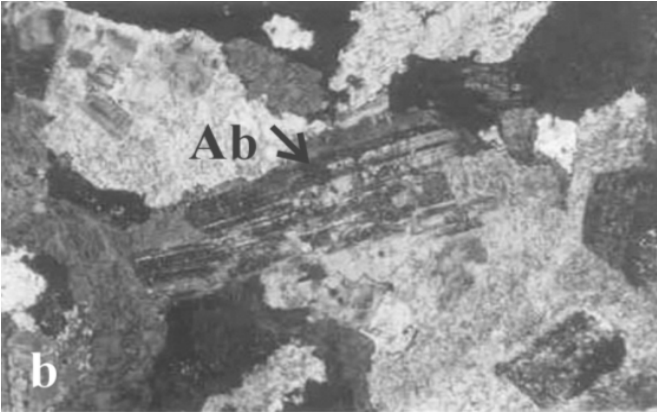
Simplified Geological Map of Panj- Kuh



Legend

Quaternary	Qt	High level piedmont and alluvial fan.
	Q _n	Low level alluvial deposits.
	QPI ^c	Conglomerate, Sandstone
Post Eocene	M	M: Monzonite and syenite.
Eocene	E ^{ab}	Andesite to tracky basalt.
	E ^{ca}	Porphyritic tracky andesite lava, basalt and tuffaceous sandstone.
	E ^{cb}	Conglomerate, red to pink coarse sandston, tuffaceous red shale.
	L _v	Tuffaceous carbonated.
	Ev2	Andesitic volcanic breccia.

Symbols	
	Fault
	River
× Fe	Iron Mine of Panj-Kuh
Cu	Ore indication
• 1420	Elevation in meter



Streckeisen)

(1974

.(Perring *et al.* 2000)

.(a)

(b) (a)
= Ab .(c)

.(b, c)

()

()

(-

.()

(Streckeisen 1974)

K

.(a)

()

.(b)

(Shreddy Biotite)

.(Hassanzadeh 1993)

.(c)

Dilles & Einaudi (1992)

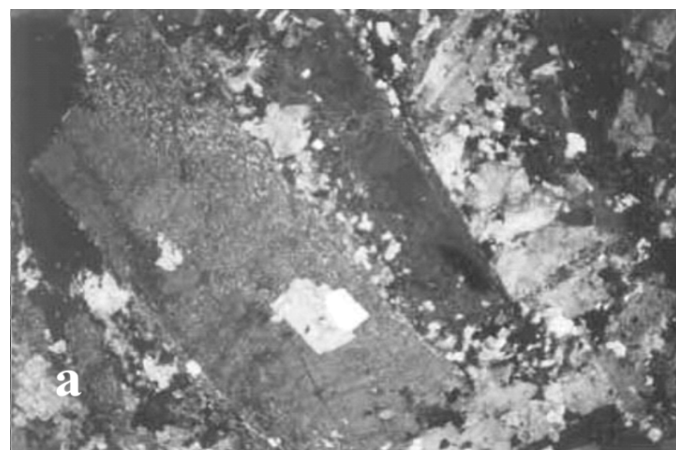
Fe/(Fe+Mg) Ti

Van Midlaar & Keith (1990)

Ti

TiO

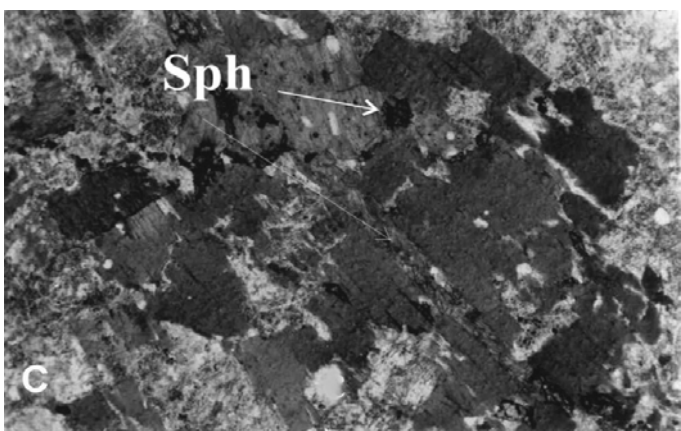
()
 () ()
 ()
 (Streckeisen 1974)



(a)
 (Dilles & Einaudi 1992)



(a)
 :
 ()
)
 .(



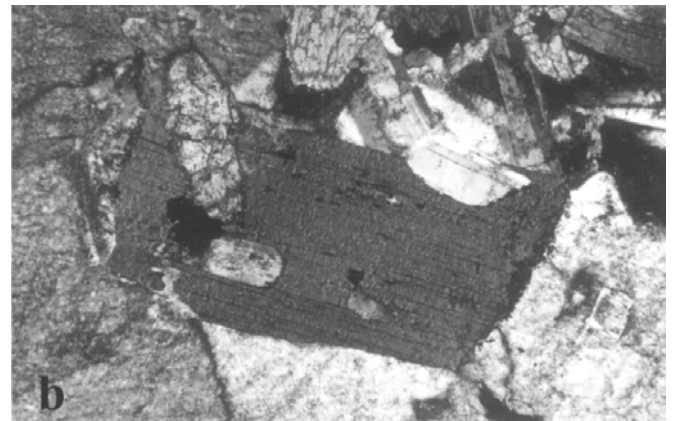
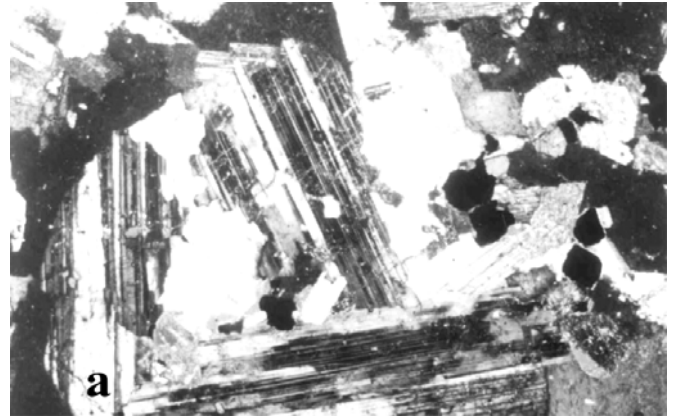
(a)
 (b)
 c b
 .(= Sph) .(c)

(%)

()

(1999) Owen & Greenough .

NaCl



(a)

(b)

TiO CaO Na O ()
Rb Ba FeO* K O V Sr P O MgO
()
Na O CaO
-
() }

Na K
Ca
Au Cu Fe

(b, c)

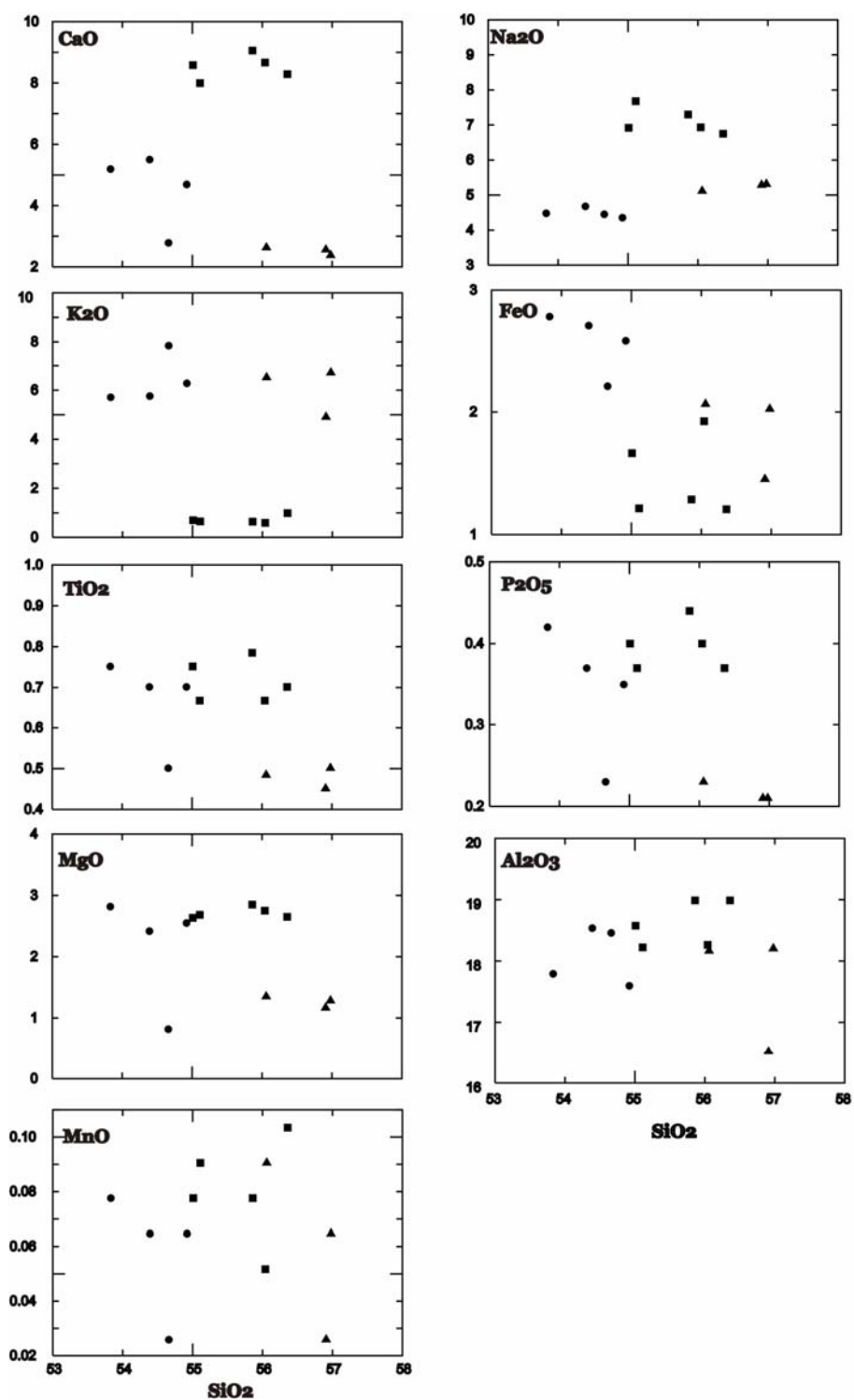
Ca²⁺ Na⁺

Co Rb Zr Ba ,FeO* K₂O
Sr V TiO₂ P₂O₅ MgO CaO Na₂O
K O .()

More & .

(1979) Liou

(Smith 1974)() .

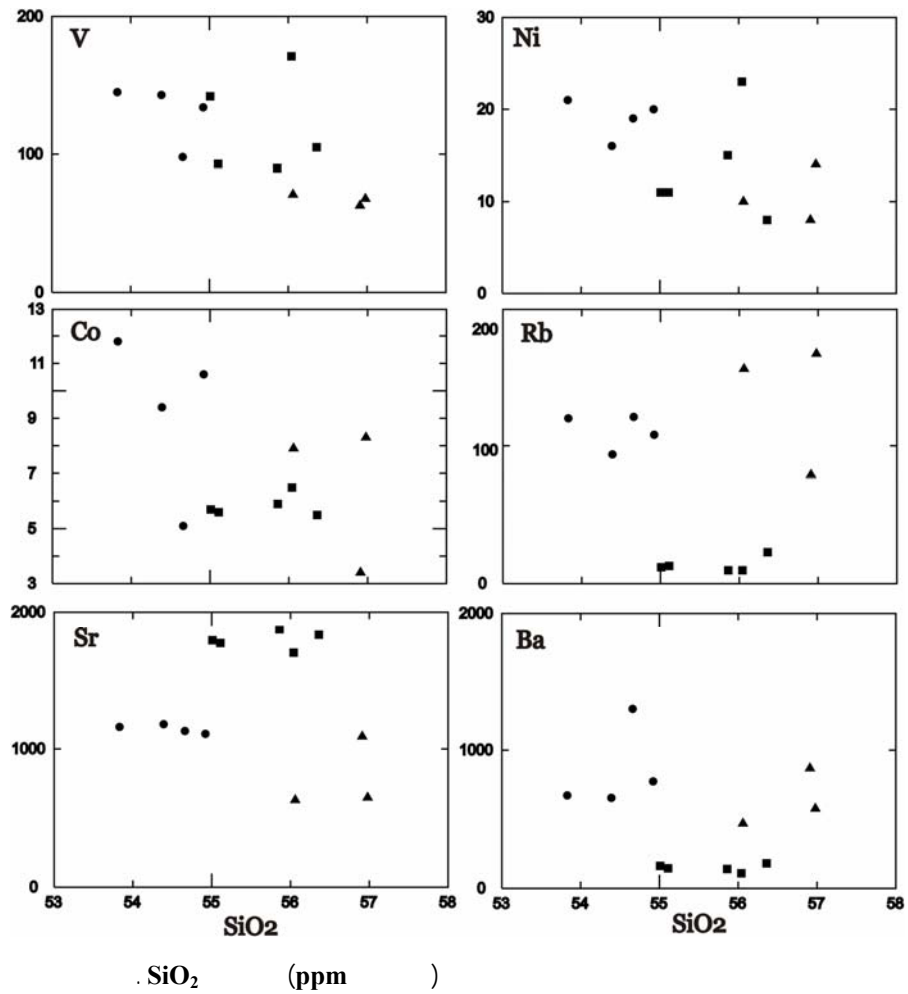


SiO_2

▲

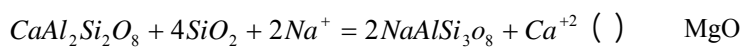
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+



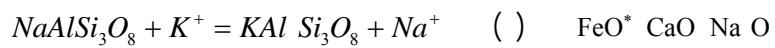
Carten)

: (1982

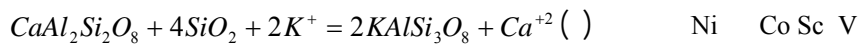


SiO_2

Ni Sc V TiO P O MnO



Rb Sr Eu K O



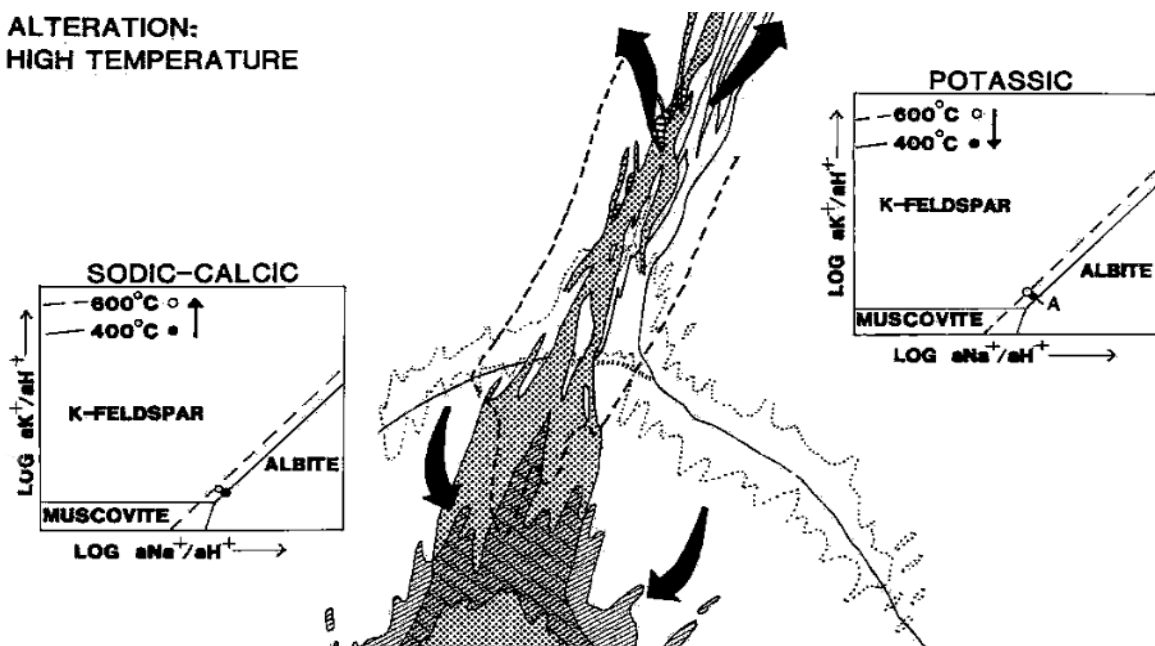
-K

(Lagach & Weisbrod 1977)

K/Na

Na-Ca K

ALTERATION:
HIGH TEMPERATURE



Ab KF

Kb

(1975) Montoya & Hemely

$K_2O - H_2O - SiO_2 - H_2O$

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ppm

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S\$	Bio-Sy	Bio-Sy	Bio-Sy	Py-Sy	Py-Sy	Py-Sy	Py-Sy	M	M	M	M	M
SiO ₂	56.06	56.98	56.91	54.66	54.92	53.83	54.39	56.04	55.1	55	55.9	56.36
TiO ₂	0.48	0.5	0.45	0.5	0.7	0.75	0.7	0.67	0.67	0.75	0.78	0.7
Al ₂ O ₃	18.16	18.2	16.52	18.46	17.6	17.79	18.54	18.26	18.2	18.6	19	18.99
Fe ₂ O ₃	2.27	2.34	1.37	2.59	2.54	2.58	2.59	1.35	0.93	1.17	0.95	0.87
FeO	2.06	2.02	1.45	2.21	2.59	2.78	2.71	1.92	1.21	1.66	1.29	1.21
MnO	0.09	0.06	0.03	0.03	0.06	0.08	0.06	0.05	0.09	0.08	0.08	0.1
MgO	1.35	1.28	1.17	0.82	2.55	2.82	2.42	2.75	2.68	2.63	2.85	2.65
CaO	2.63	2.38	2.56	2.79	4.69	5.19	5.5	8.67	7.99	8.58	9.06	8.29
Na ₂ O	5.12	5.31	5.28	4.45	4.35	4.48	4.68	6.93	7.68	6.92	7.3	6.75
K ₂ O	6.52	6.71	4.9	7.85	6.28	5.71	5.76	0.59	0.65	0.7	0.64	0.99
P ₂ O ₅	0.24	0.21	0.21	0.24	0.36	0.43	0.38	0.4	0.38	0.4	0.45	0.38
Total*	94.99	96.01	90.86	94.58	96.63	96.45	97.73	97.64	95.6	96.5	98.2	97.28
Cr	68	52	95	52	47	49	67	120	87	60	80	54
Ni	10	14	8	19	20	21	16	23	11	11	15	8
Co	7.9	8.3	3.4	5.1	10.6	11.8	9.4	6.5	5.6	5.7	5.9	5.5
Sc	6	6	5	6	11	11	11	11	12	12	12	12
V	71	68	63	98	134	145	143	171	93	142	90	105
Rb	156	167	78.9	121	108	120	93.7	9.7	12.9	11.9	9.7	22.9
Cs	3.6	3.8	0.7	2.1	2.3	2.5	1.7	0.7	35.8	1.1	0.9	0.8
Ba	471	579	868	1300	773	676	658	110	146	164	141	182
Sr	633	651	1090	1130	1110	1160	1180	1700	1770	1790	1870	1830

LOI Total *

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