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Rb Zr Ba FeO K₂O

Sc V Sr P₂O₅ TiO₂ MgO CaO N₂O

XRD

ICP MS ICP

S.G.S.

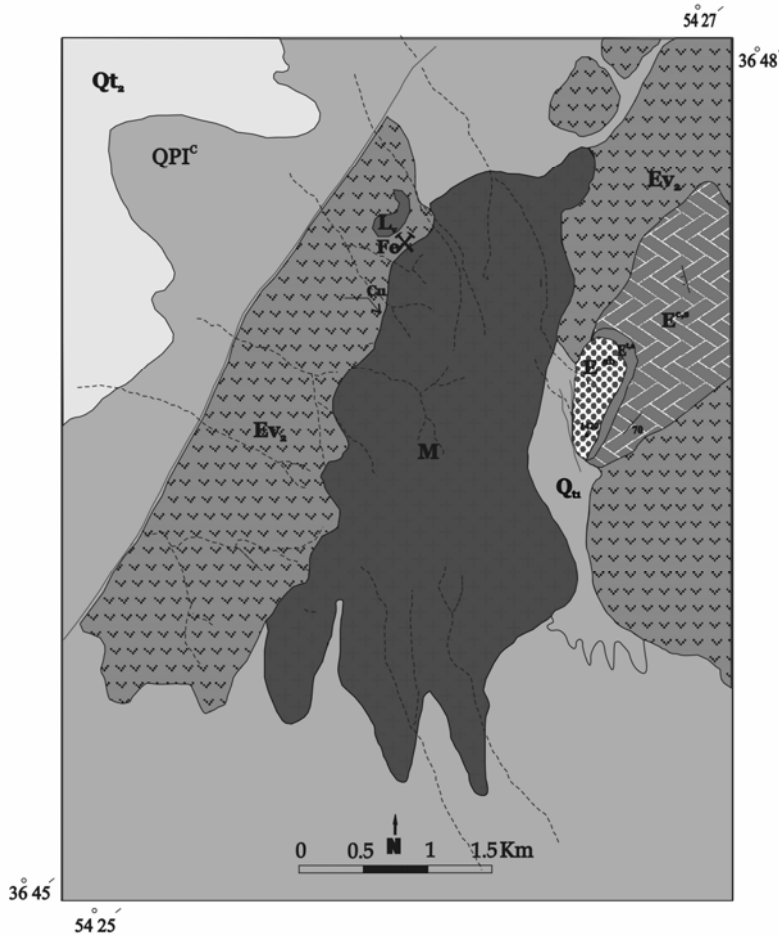
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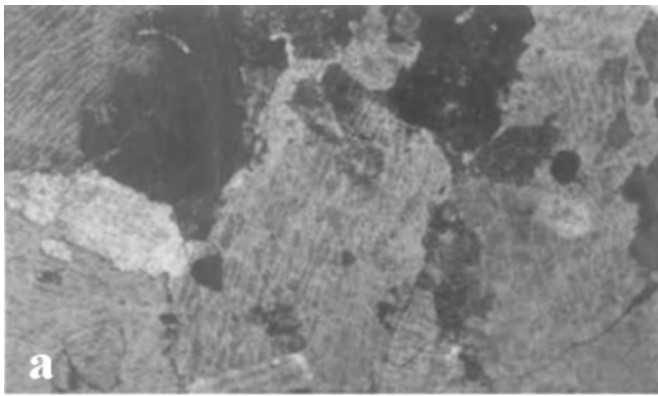
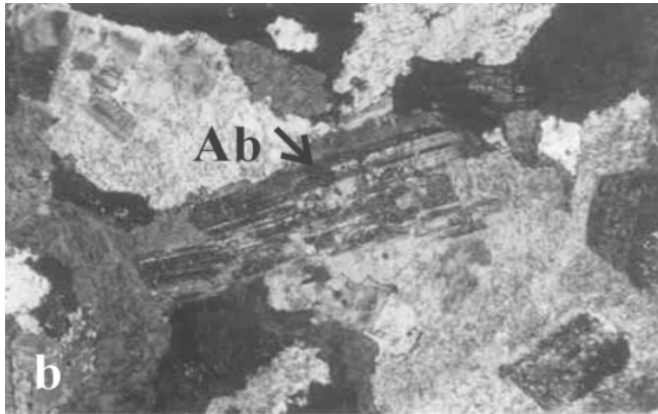
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Simplified Geological Map of Panj- Kuh



Legend

Quaternary	Q _h	High level piedmont and alluvial fan.	Symbols Fault River Iron Mine of Panj-Kuh Ore indication Elevation in meter
	Q _l	Low level alluvial deposits.	
	PIQ ^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 ^{ca}	Conglomerate, red to pink coarse sandston, tuffaceous red shale.	
	L _v	Tuffaceous carbonated.	
	Ev ₂	Andesitic volcanic breccia .	



(b)

(a)

= Ab .(c)

Streckeisen)

(1974

.(Perring *et al.* 2000)

.(a)

.(b, c)

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(-)

()

(Streckeisen 1974)

K

(a)

()

(b)

(Shreddy Biotite)

(Hassanzadeh 1993)

(c)

Dilles & Einaudi (1992)

Fe/(Fe+Mg) Ti

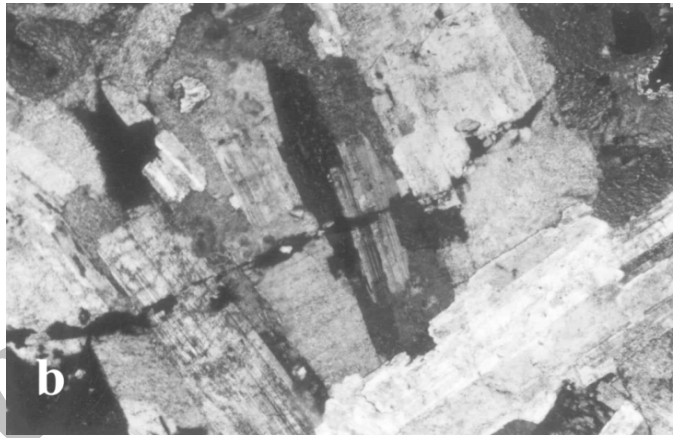
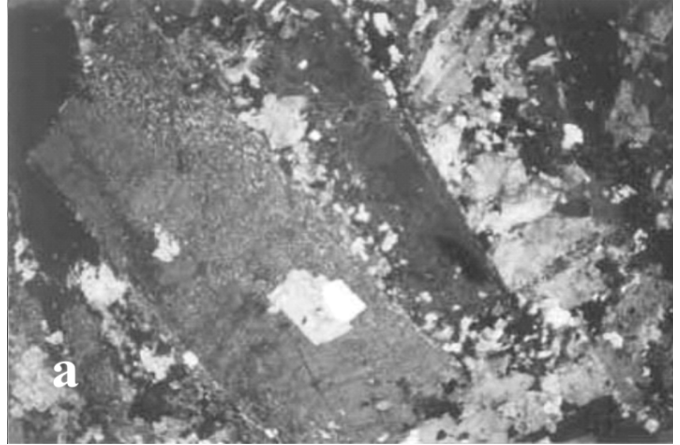
Van Midlaar & Keith (1990)

Ti

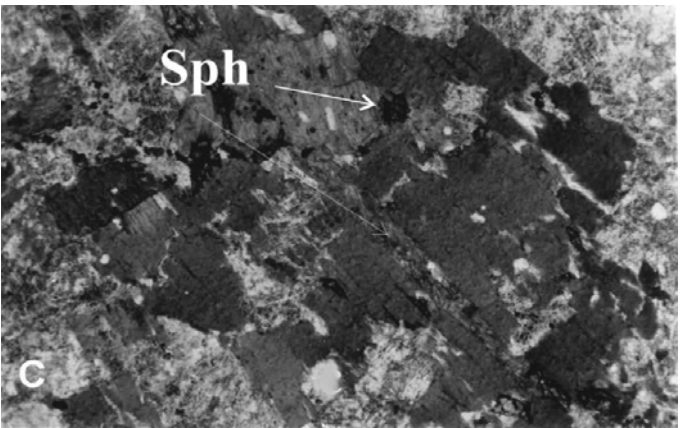
TiO

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 (Streckeisen 1974)



(a)
 (Dilles & Einaudi 1992)



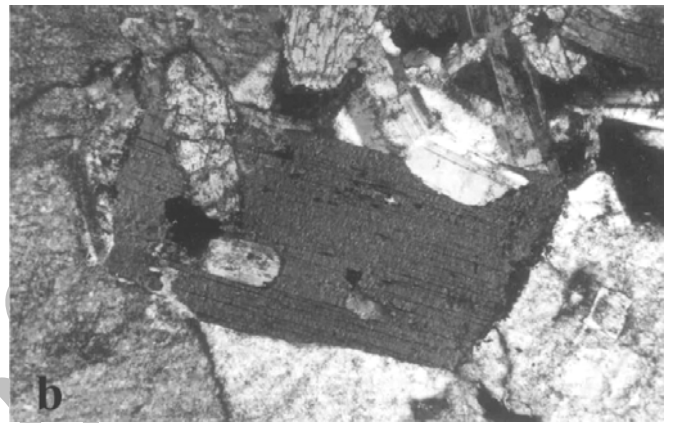
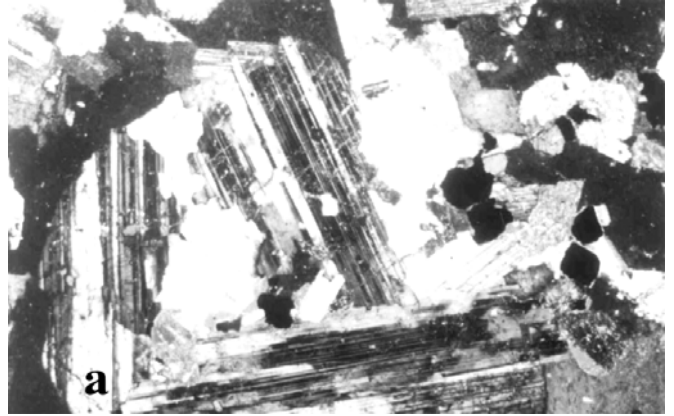
(a)
 ()
)
 ()
)

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

(%)

(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)

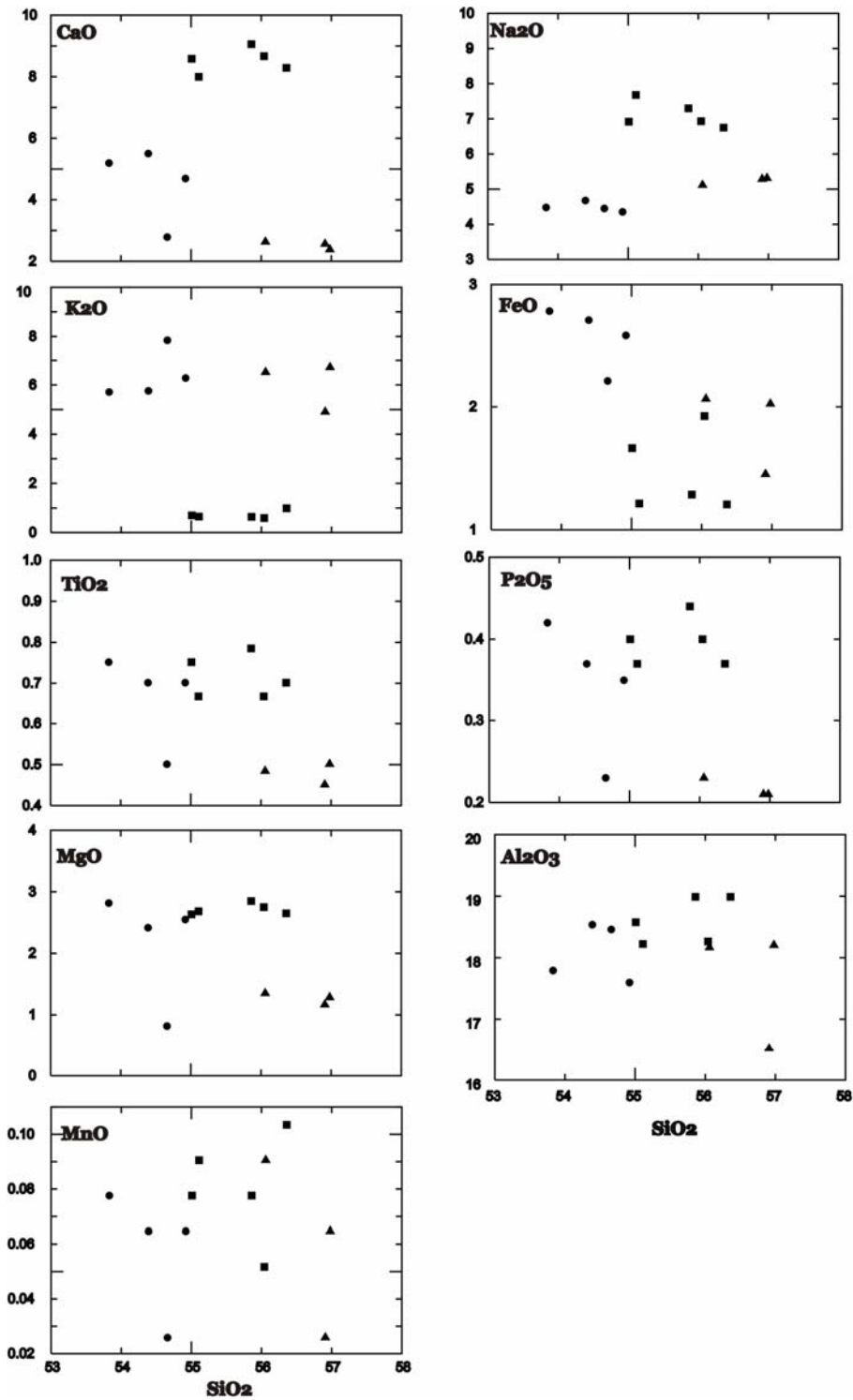
Ca²⁺ Na⁺

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

More & .

(1979) Liou

(Smith 1974) ()

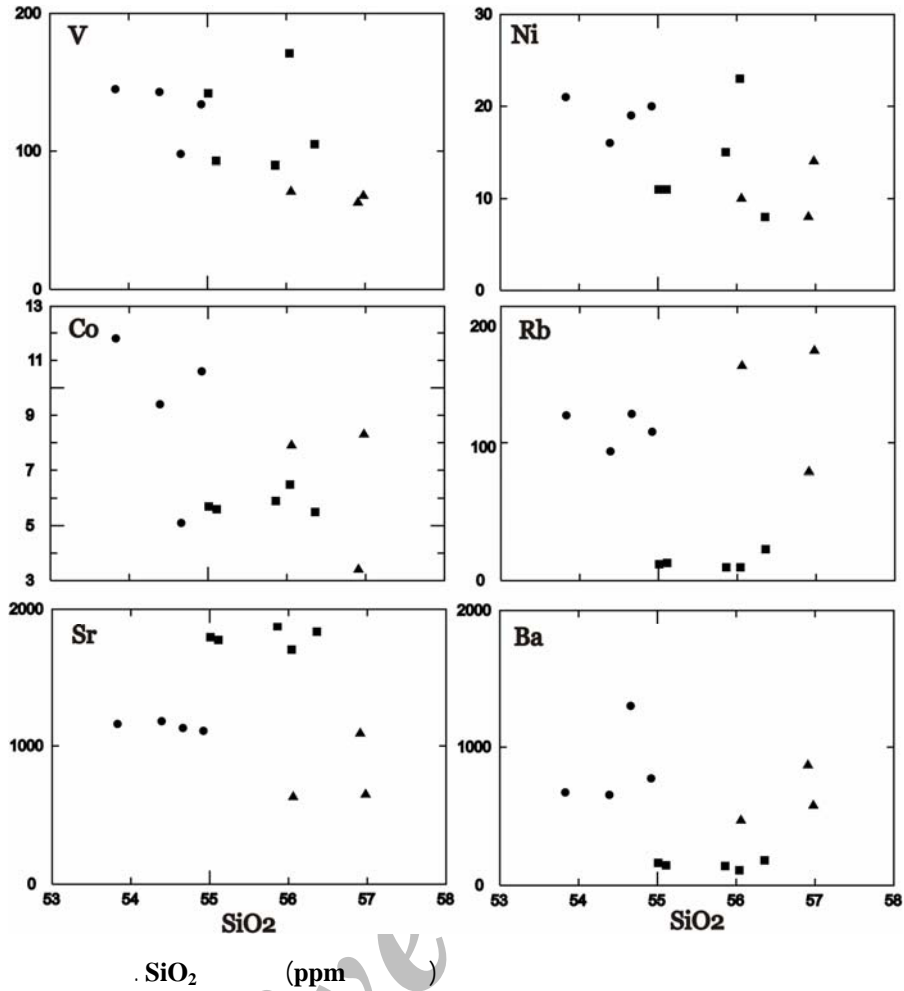


SiO₂

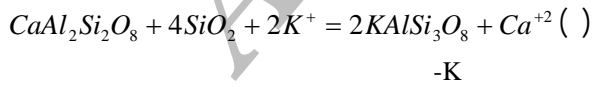
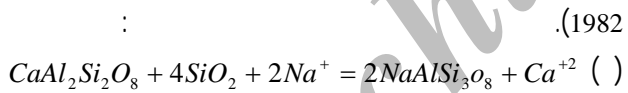
▲

●

+



Carten)



MgO

SiO₂

Ni Sc V TiO P O MnO

FeO* CaO Na O

Rb Sr Eu K O

Ni Co Sc V

.(Lagach & Weisbrod 1977)

K/Na

Na-Ca K

()

ppm

()

S§	Bio-Sy	Bio-Sy	Bio-Sy	Py-Sy	Py-Sy	Py-Sy	Py-Sy	M	M	M	M	M
SiO₂	56.06	56.98	56.91	54.66	54.92	53.83	54.39	56.04	55.1	55	55.9	56.36
TiO₂	0.48	0.5	0.45	0.5	0.7	0.75	0.7	0.67	0.67	0.75	0.78	0.7
Al₂O₃	18.16	18.2	16.52	18.46	17.6	17.79	18.54	18.26	18.2	18.6	19	18.99
Fe₂O₃	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
Na₂O	5.12	5.31	5.28	4.45	4.35	4.48	4.68	6.93	7.68	6.92	7.3	6.75
K₂O	6.52	6.71	4.9	7.85	6.28	5.71	5.76	0.59	0.65	0.7	0.64	0.99
P₂O₅	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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Carten R.B. 1982: Sodium–calcium metasomatism: Chemical, temporal and spatial relationship at Yerington, Nevada, porphyry copper deposit. *Econ. Geol.* **81**: 1495-1519

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- Dilles J.H., Einaudi M.T. 1992: Wall-rock alteration and hydrothermal flow paths about the Ann-Mason porphyry copper deposit, Nevada. *Econ. Geol.* **87**: 1963-2001.
- Hassanzadeh J. 1993: Metallogenic and tectonomagmatic events in the SE sector of the cenozoic active continental margin of central Iran (Shahre Babak area, Kerman Province). *Ph. D. dissertation. Uni. Calif., Los Angeles*. Pp. 102-105.
- Hemley J.J., Cygan G.L., Fein J.B., Robinson G.R., Angelo W.M. 1992: Hydrothermal ore-forming Processes in the light of studies in rock buffered systems: Iron-Copper-Zinc-lead Sulfide solubility relations. *Eco. Geo.* **87**: 1-22.
- Montoya J.W., Hemely J.J. 1975: Activity relations and stabilities in alkali feldspar and mica alteration reactions: *Econ. Geol.* **70**: 577-583.
- Lagach M., Weisbrod A. 1977: The system, two alkali feldspars -KCl-NaCl-H₂O at moderate to high temperatures and low pressures. *Cont. Miner. Petrol.* **62**: 77-101
- More D.E., Liou J.G. 1979: Chessboard- twinned albite from Franciscan metaconglomerate of the Diablo Range, California. *Am. Mineral.* **64**: 329-336.
- Owen J.V., Greenough J.D. 1999: Scapolite pegmatite from the Minas fault, Nova Scotia: tangible manifestation of Carboniferous, evaporite derived hydrothermal fluids in the western Cobequid highlands. *Mineral. Mag.* **63**: 387-397.
- Perring C.S., Pollard P.J., Dong G., Blake K.L. 2000: *The Lightning Creek Sill Complex, Cloncurry District, North west Queensland: A source of fluids for Fe Oxide Cu-Au mineralization and sodic- calcic Altration.* *Econ. Geol.* **96**: 1067-1089.
- Smith J.V. 1974: Feldspar minerals. Vol. 2. Springer Verlag, Berlin – Heidelberg.
- Streckeisen A. L. 1974: To each plutonic rock its proper name. *Earth Sci. Rev.* **12**: 1-33.
- Van Middelaar W.T., Keith J. D. 1990: Mica chemistry as an indicator of Oxygen and halogen fugacities in the Cantung and other W-related granitoids in the North American Cordillera. In: Stein H.J. & Hannah J.L. (eds), Ore – bearing granite systems, petrogenesis and mineralizing processes. Geological Society of America Special Paper.

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