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XRD, NAA

The study of Acid- Sulfate Alteration on the Volcanic Rocks in the Shahrzad Ore Deposits (South West of Nain)

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Abstract:

The study area is situated in the Cenozoic central Iranian magmatism belt, in Southwest of Nain. The Eocene country rocks covering a vast area are predominantly volcanic and pyroclastic. These rocks are acid to intermediate in composition and range from pyroxene- andesite through trachy-andesite to trachy- dacite. The country rocks have been subjected to trachy- alterations including silicification, sericitization, chloritization, kaolinitization and particularly alunization. The latter alteration is widespread and due to its importance for mercury, silver and gold mineralization a major part of the study has been focused on it.

The altered volcanic rocks consist mainly of alunite, natro- alunite, jarosite as well as barite, pyrite, hematite and microcrystalline quartz. The geochemical study of altered rocks was carried out by using NAA and XRD methods. The obtained data indicated that the studied rocks are enriched in silver, mercury and gold and an epithermal model may be proposed for the hydrothermal alteration of the study area.

Keywords: Alteration, Volcanic Rocks, Alunite, Epithermal ore deposit, Central Iran Magmatism, Nain

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Au, Ag

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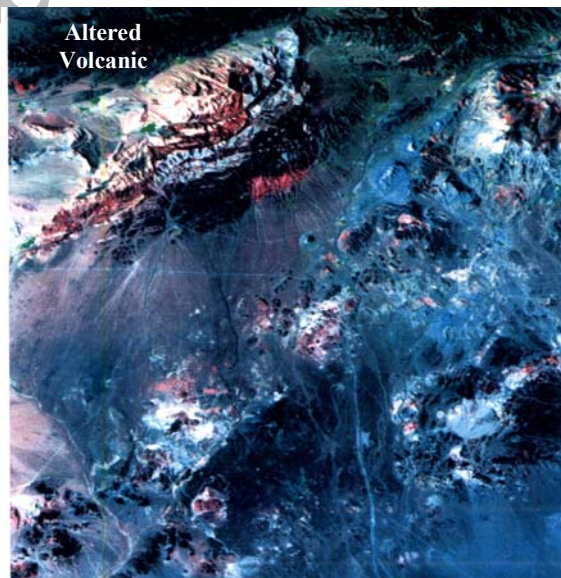
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Shahabpour and Karmers, 1987

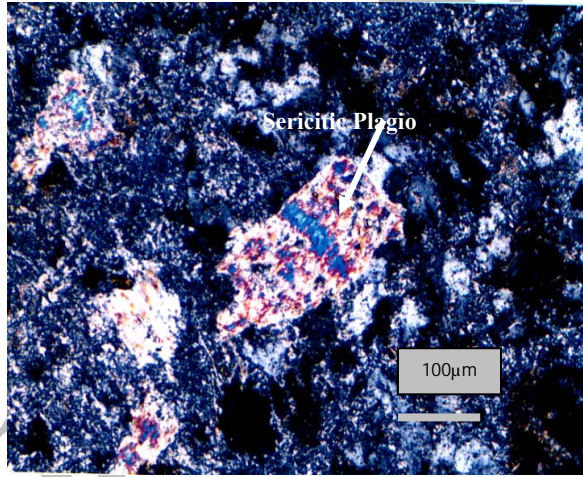
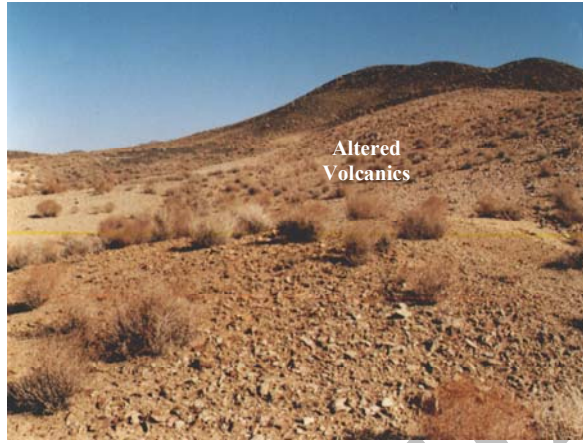


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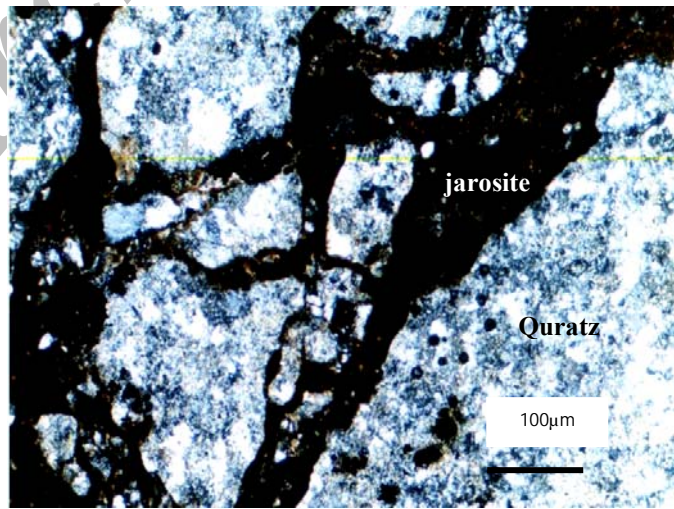


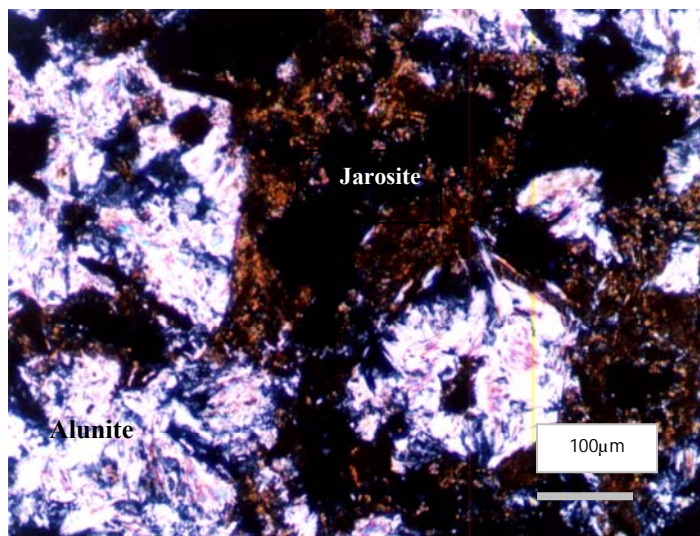
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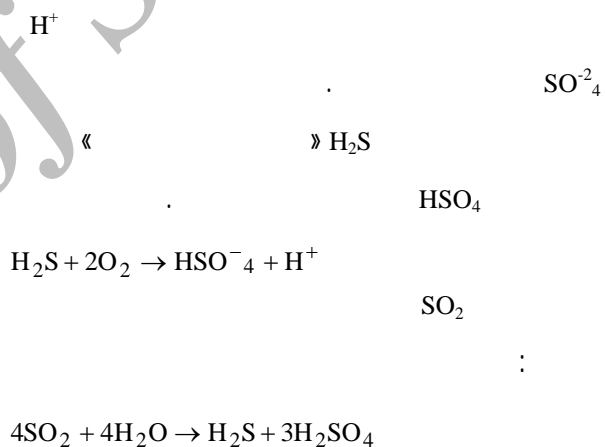
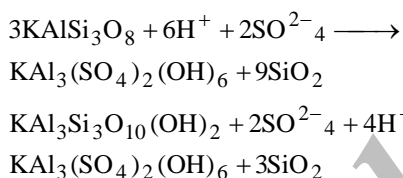


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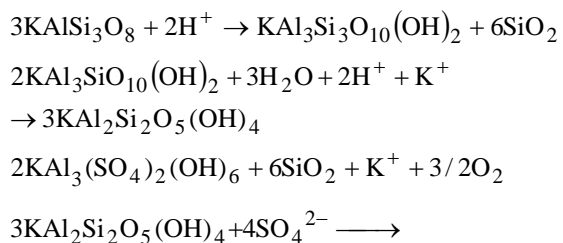
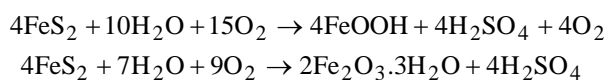




(XPL



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(SEM)

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,Al, Si, K, Fe³⁺, Fe²⁺,

Cu, Na Mg

(X)X

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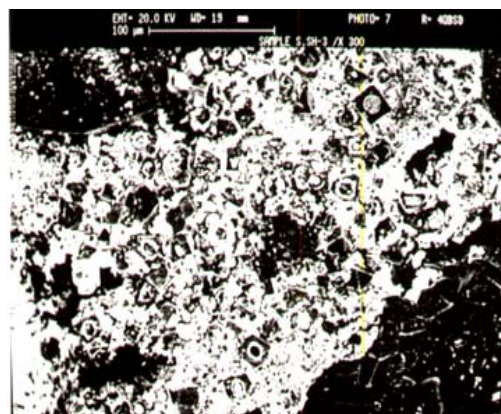
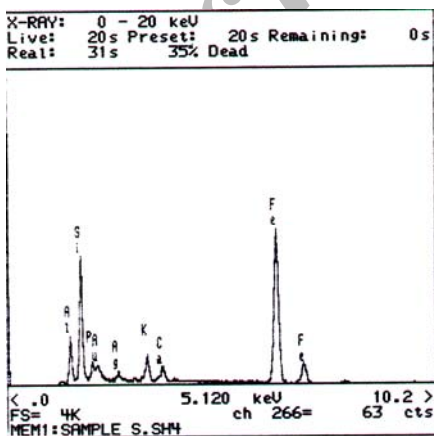
PH

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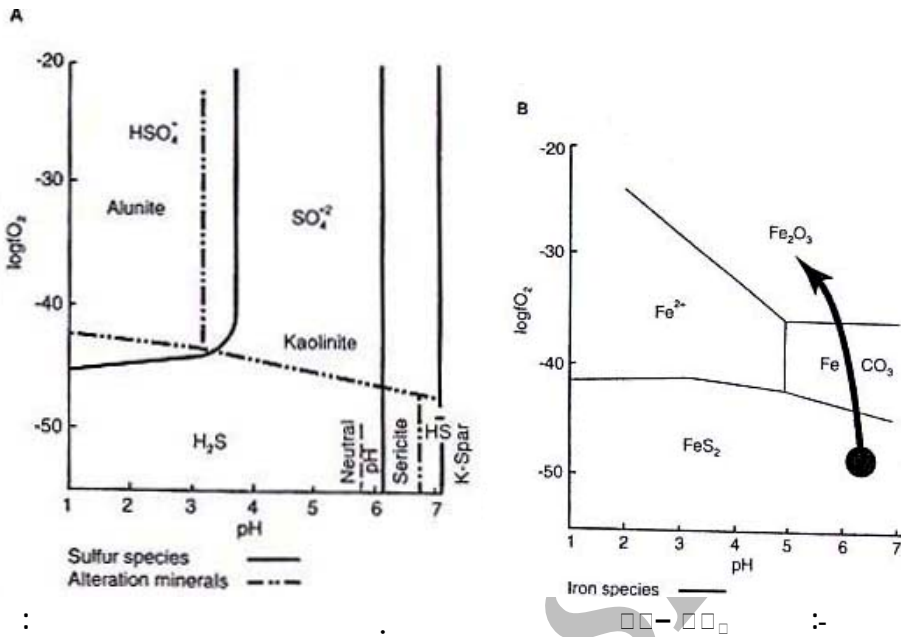
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X

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RGB



- A
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() NAA . []

Na Sr PH Al . []

RGB

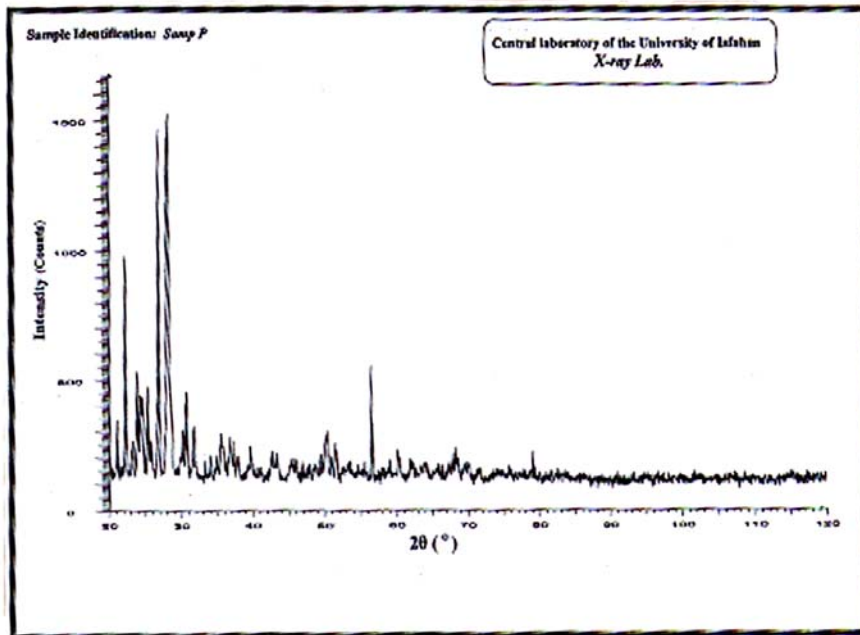
Element(pp m)	S.G-1	S.G-2	S.G-3	S.G-4	S.SH	S.SH-1
Ag	614.9	49.6	0.21%	<4.4	178.9	12.7
Al	-	-	-	-	1.30%	14.20%
As	0.14%	234.3	2.56%	0.17%	206.5	155.4
Au	<1.9	51*	4..32	<42*	291*	112*
Ba	14.25 %	<285.8	3.88%	460.25	4931	229
Ca	-	-	-	-	0.58%	0.72%

Element(ppm)	S.G-1	S.G-2	S.G-3	S.G-4	S.SH	S.SH-1
Ce	<976	73.6	0.1%	23.8	3.2	10.2
Cu	-	-	-	-	4.79	939.2
Dy	<5	3.9	<5.9	<636*	880*	915*
Eu	-	-	-	-	248*	280*
Fe	3.04%	1.32%	6.65%	20.71%	3.57%	3.30%
K	0.57%	3.67%	0.88%	7.19%	0.28%	0.12%
La	7.42	44.14	<13.8	11.82	208	3.5
Lu	5.2	505*	<6.4	103*	90*	96*
Mg	-	-	-	-	0.25	1.29%
Na	0.33%	0.10%	0.18%	0.58%	262.7	0.13%
Rb	<532.5	175.7	<652	105.9	35	34.1
Sb	2.36%	321.6	4.09%	464.7	14.7	147.5
Sm	8.65	4.93	<3.5	2.21	500	19.9
Sr	387.1	<282	<419.4	0.19%	280	0.14%
Zn	<546.9	56.4	541.2	170.4	0.20%	459.3
Zr	-	194.4	-	108.7	230	179.2

* = ppb

S (XO₄) .
 () . A [] AB₃(XO₄)₂(OH)₆
 B . REE, (Ba,Ca, Pb, NH₄, Ag, K, U)
 Al, Fe, Cu, Zn

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Al, K

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SiO₂

SiO₂

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SO₄

Na, Sr

A

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K₂SO₄ H₂SO₄

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Ag, Au, As, Sb

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