NOP-ECP-1

PETROGRAPHY

Sample No.: NOP-ECP-1-TS1

Locality: Sierra Para Blanca, Chihuahua, Mexico

Formation: Nopal

Classification (rock type): rhyolite tuff

Matrix or groundmass: 80%

cryptocrystalline to fine crystalline qtzy-feld.
clay
calcite

Grains or crystals: 20%

Phenocrysts:

Qtzy - 13%
Feldspar - 5%

Lithoclasts:

VRFS - 2%

Texture or fabric:

Slightly welded, porphyritic.
Vitroclastic texture well preserved, glass shards replaced by quartz. Under plane light, shard vestiges of glass shards are very well preserved.
Devitrification has resulted in groundmass to crypto- to fine-crystalline quartz-feldspar intergrowths.

Alteration/Mineralization:

Devitrification of glass to crypto-to-fine crystalline qtzy + feldspar.
Coarser crystalline groundmass may result from alteration of cryptocrystalline groundmass. Fibrous calcite or qtz replaces some glass shards.

Volcanic processes or depositional origin:

Air fall.

PETROGRAPHY

Sample No.: NOP-ECP-1-TS2

Locality: Sierra Pera Blanca, Chihuahua, Mexico

Formation: ~~[illegible]~~ Nopal

Classification (rock type): Rhyolite tuff

Matrix or groundmass: 80%

crypto crystalline quartz-feldspar
Fine crystalline quartz-feldspar intergrowth
Fibrous calcite [illegible]
clay.

Grains or crystals: 20

Phenocrysts:

Quartz - 13%
Feldspar - 5%

Lithoclasts:

VRFs - 2%

Texture or fabric:

Same as NOP-ECP-1-TS1

Alteration/Mineralization:

Same as NOP-ECP-1-TS1

Volcanic processes or depositional origin:

Air fall

PHOTOGRAPHY

Photographer: JP

Microscope: Nikon

Type of photography: Standard Thin Section

Camera: Nikon

Date: 5/3/91

Film: Ektar 125

Photo No.	Sample No. and description	Obj.	FOV	Light
	NOP-ECP-1-TS1			
1	Qtz phenocryst in groundmass of glass shards & cryptocrystalline qtz-field.	4x	3.0mm	XN
2	Same as #1. Shows preserved texture of glass shards.	4x	3.0mm	PL
3.	Shows devitrified groundmass of cryptos to fine crystalline qtz-field.	4x	3.0mm	XN
4	Same as #3.	4x	3.0mm	PL
5	Close up of replaced glass shards & groundmass of fine crystalline qtz	10x	1.7mm	XN
6	Same as #5.	10x	1.7mm	PL

PHOTOGRAPHY

Photographer: JP

Microscope: Nikon

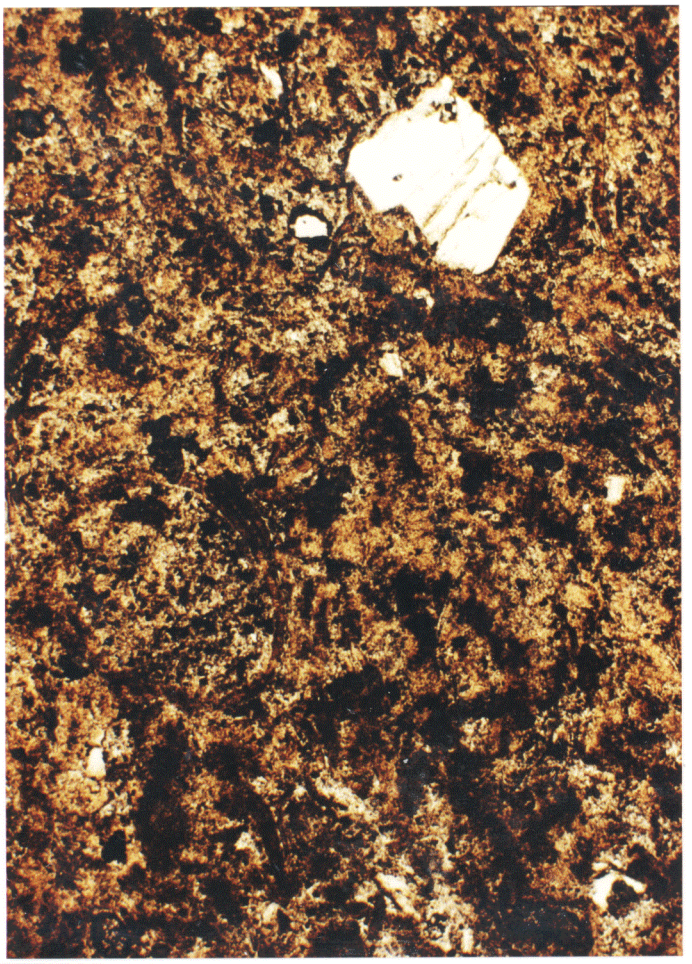
Type of photography: Standard thin section

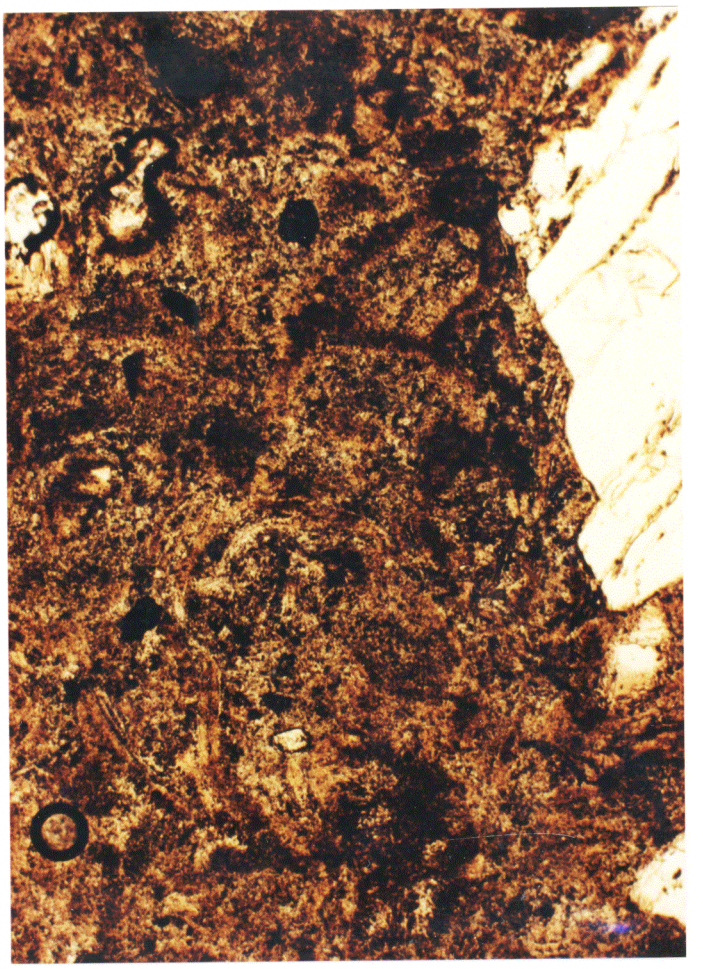
Camera: Nikon

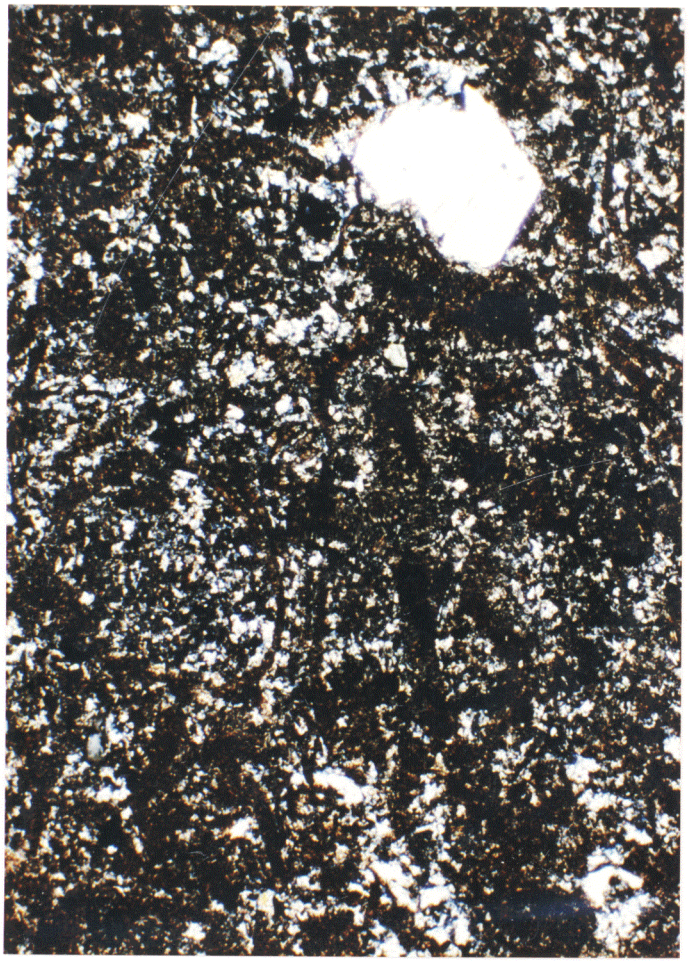
Date: 5/3/91

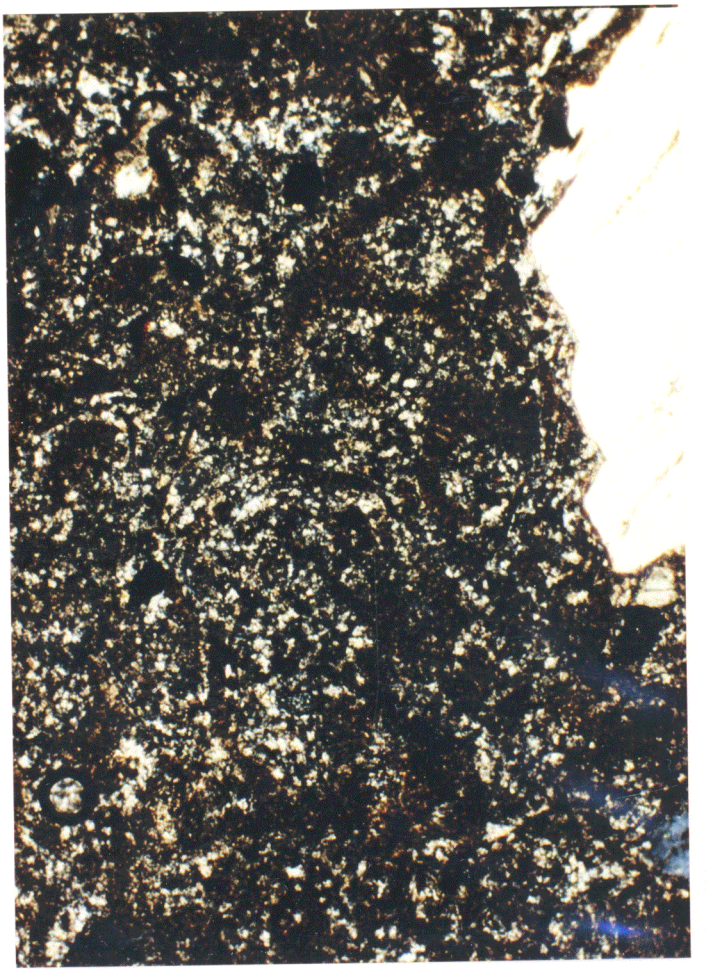
Film: Ektar 125

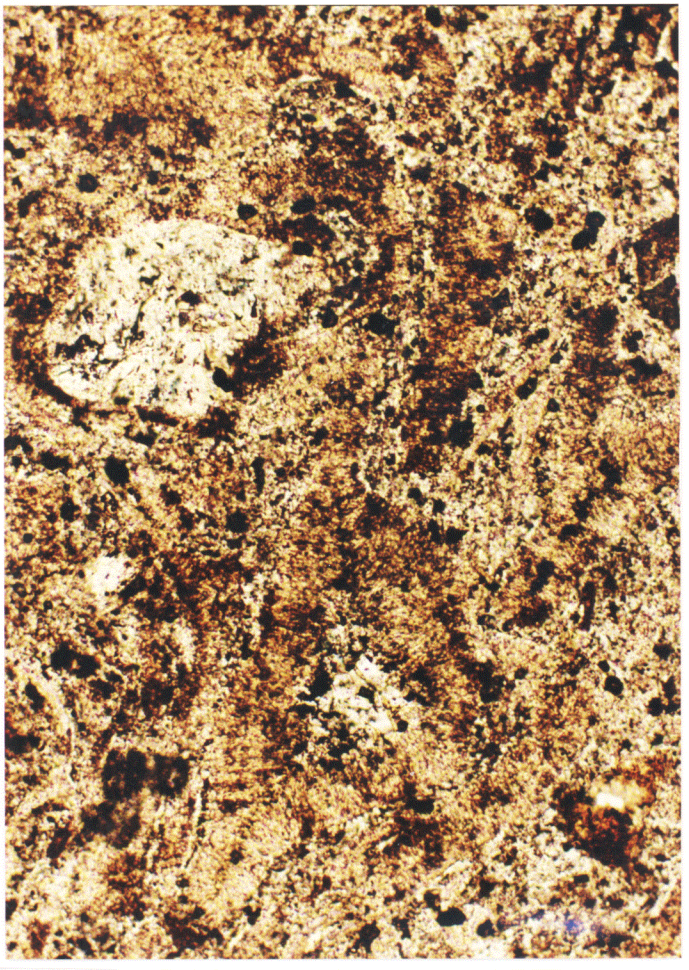
Photo No.	Sample No. and description	Obj.	FOV	Light
	NOP-ECP-1-TS2			
7	Groundmass of replaced glass shards + cryptocrystalline + fine crystalline grey	4x	3.0mm	XN
8	Same as #7.	4x	3.0mm	PL
9.	Closeup of groundmass-replaced shards, crypto to fine crystalline grey	10x	1.7mm	XN
10	Same as #9	10x	1.7mm	PL
11	Oty or feldspar phenocryst in devitrified groundmass	4x	3.0mm	XN
12	Same as #11	4x	3.0mm	PL
13	Closeup of feldspar oty phenocryst in devitrified groundmass	10x	1.7mm	XN
14	VRF in devitrified groundmass	10x	1.7mm	XN

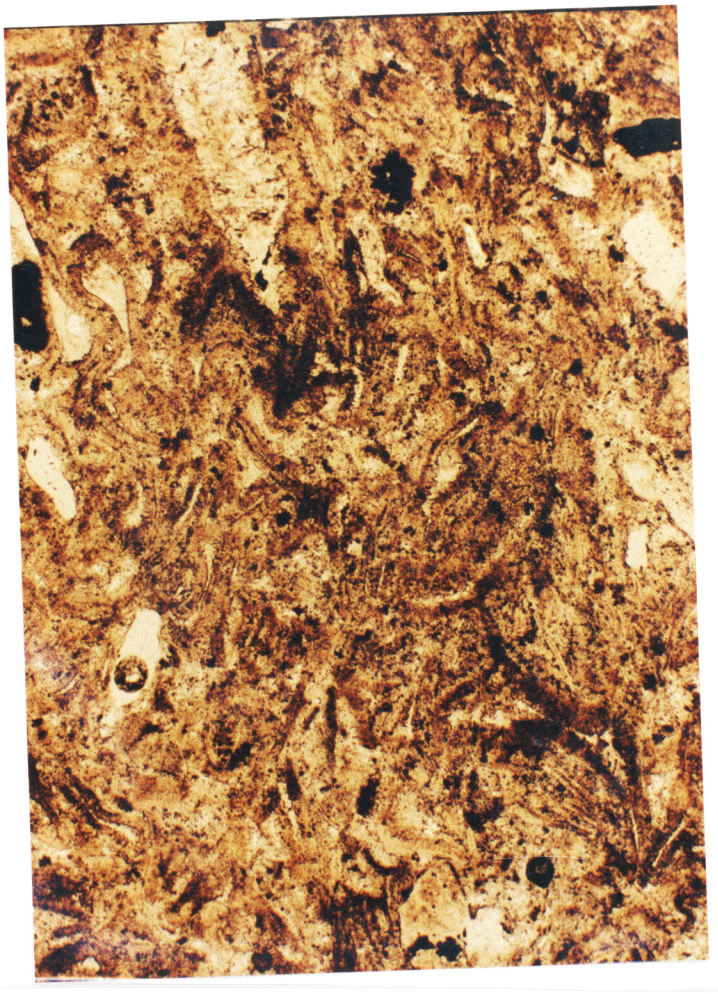


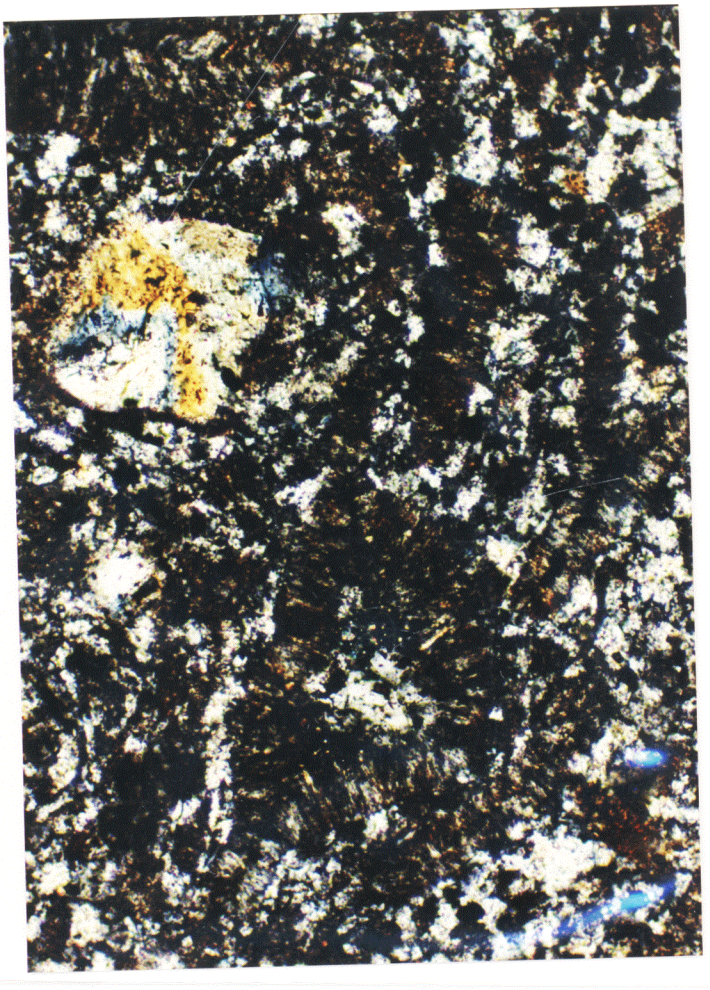


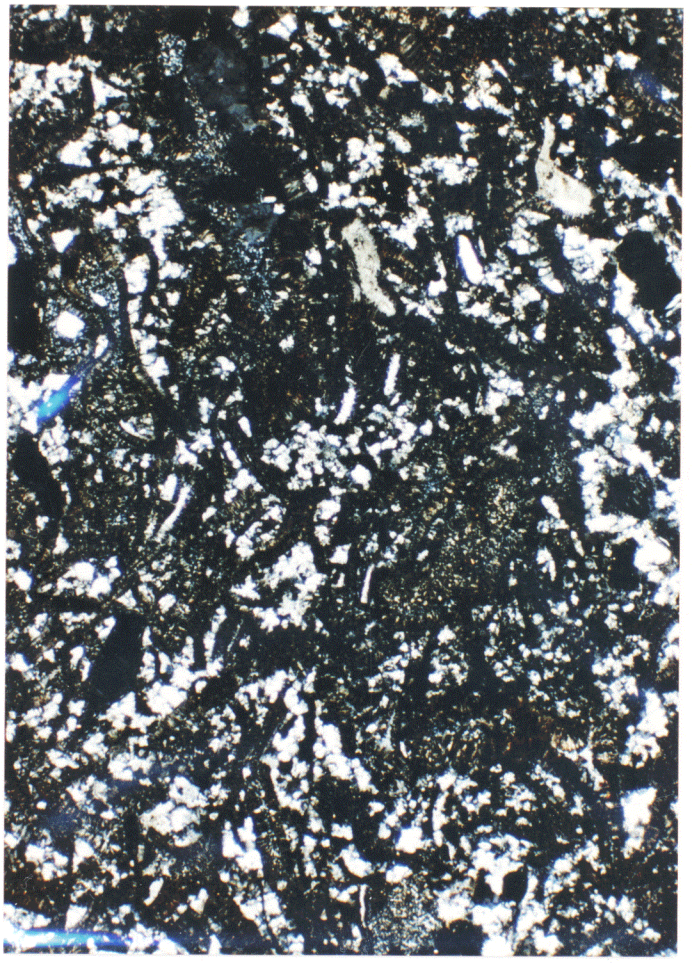


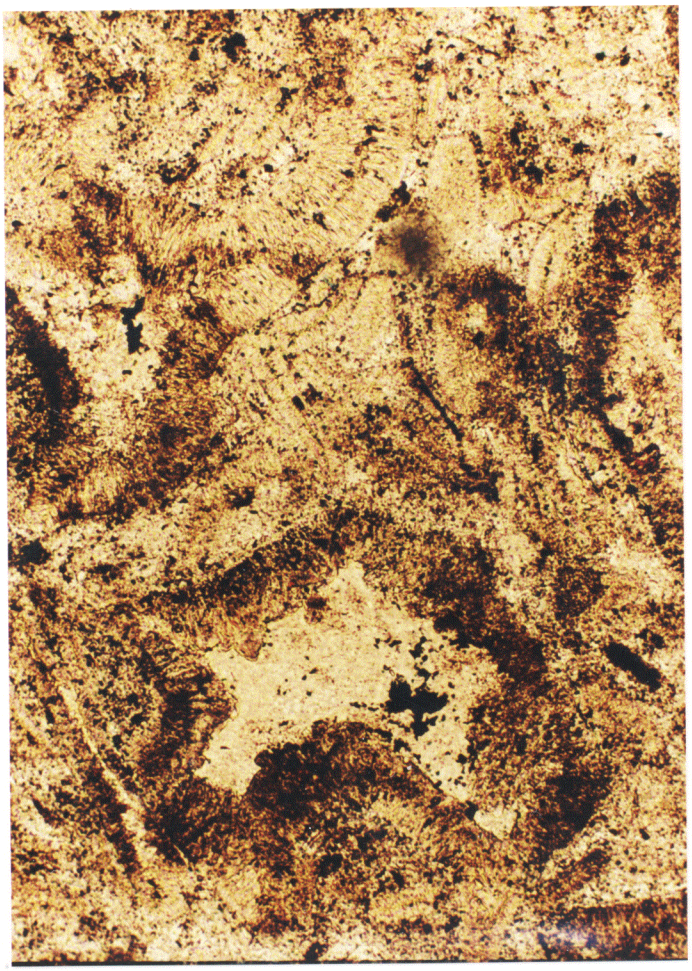


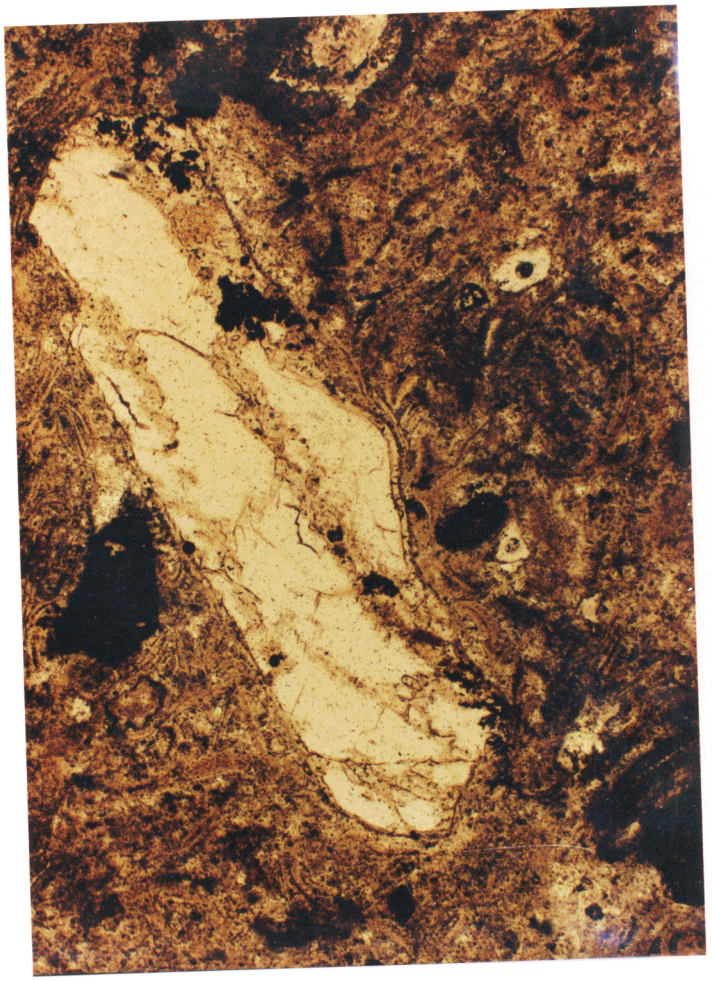


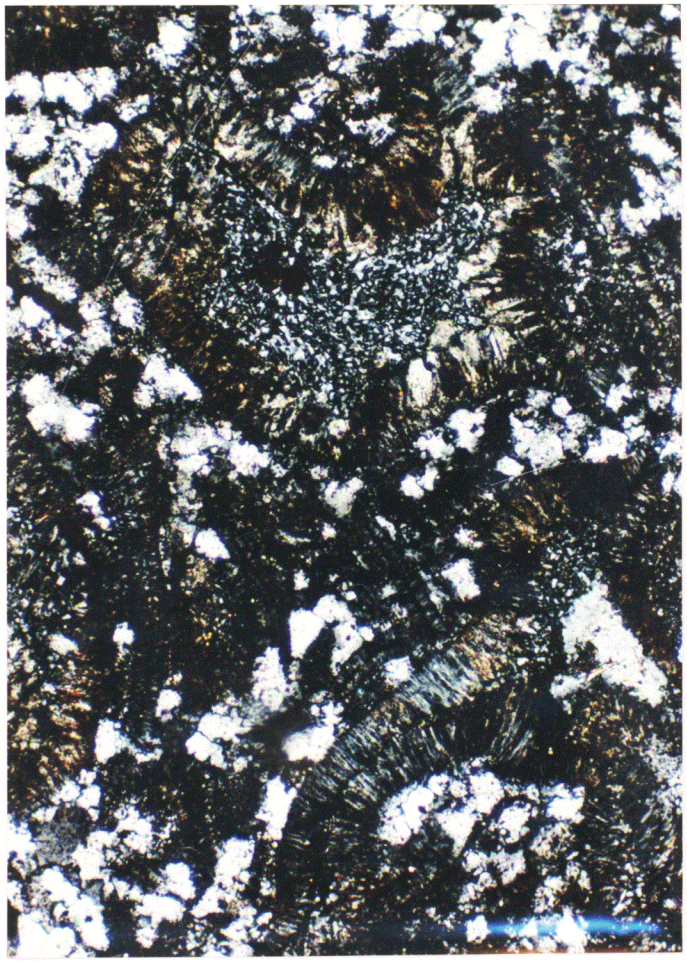


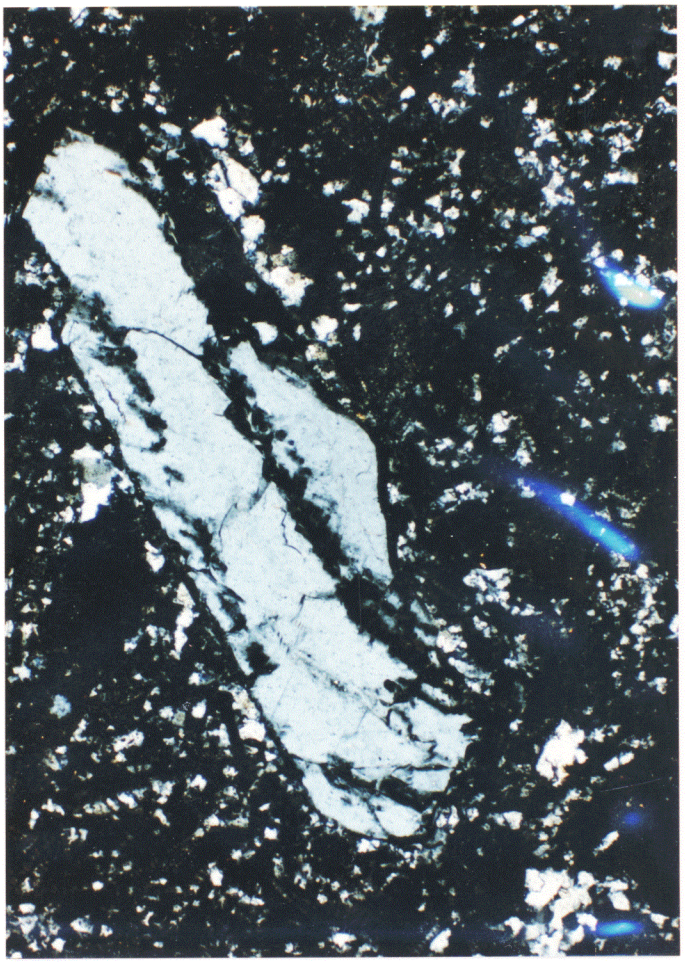


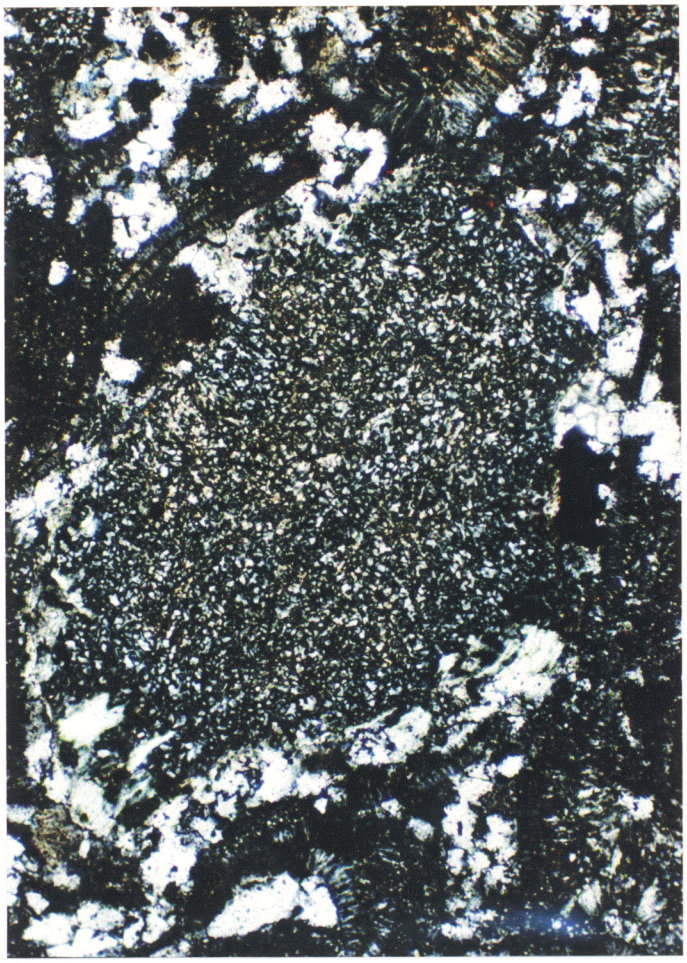












NOP-ECP-2

PETROGRAPHY

Sample No.: NOP-ECP-2-TS1

Locality: Sierra Pena Blanca, Chihuahua, Mexico

Formation: Nopal

Classification (rock type): lithic vitrophyre

Matrix or groundmass: 70%
perlitic glass

Grains or crystals: 30%
Phenocrysts:
Qtz - 5%
Feldspar - 5%

Lithoclasts:
VRFs - 20%

Texture or fabric:
Porhyritic, glassy fabric - phenocrysts and lithoclasts in a perlitic glass.

Alteration/Mineralization:
Crack in perlite glass are being refilled by calcite.
Calcite replaces some phenocrysts & lithoclasts partially or entirely.
Glass has undergone some devitrification as evidenced by cryptocrystalline quartz-feldspar in matrix.

Volcanic processes or depositional origin:
Air fall.

PHOTOGRAPHY

Photographer: JP

Type of photography: Standard thin section

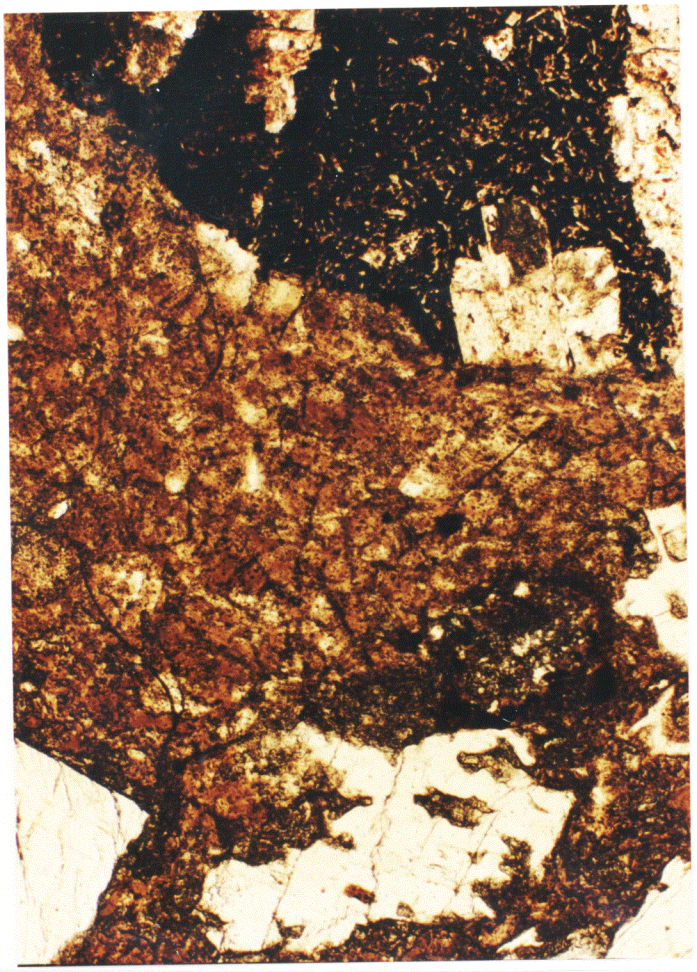
Date: 5/3/91

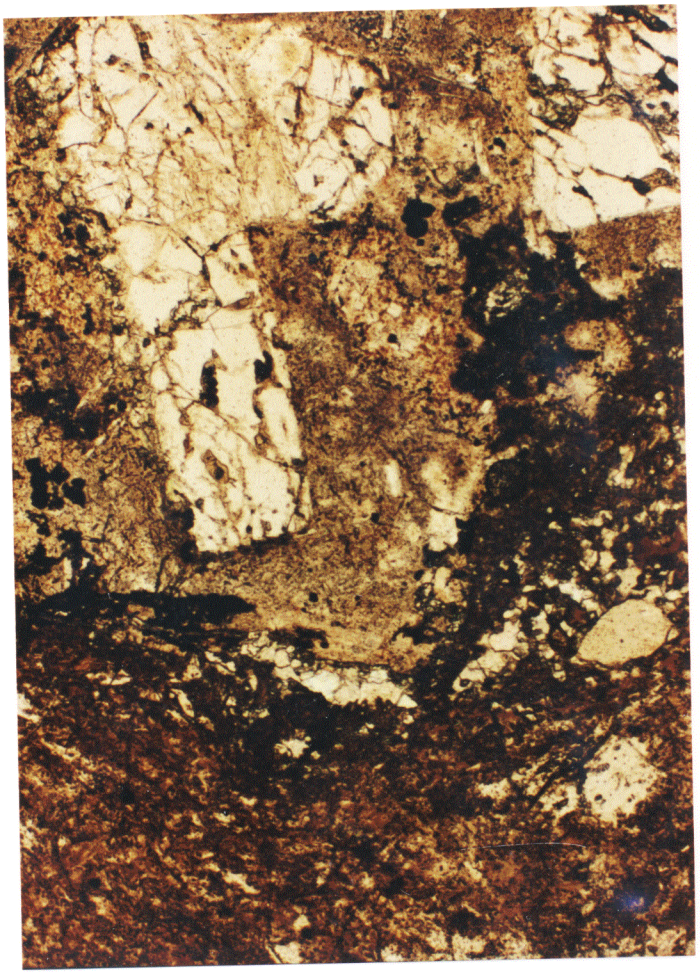
Microscope: Nikon

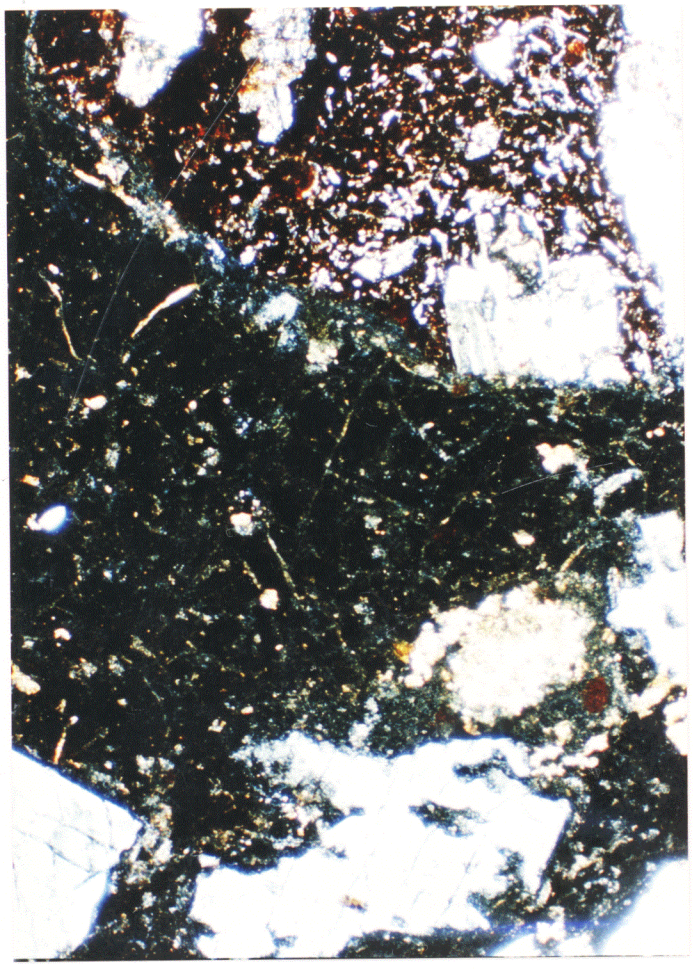
Camera: Nikon

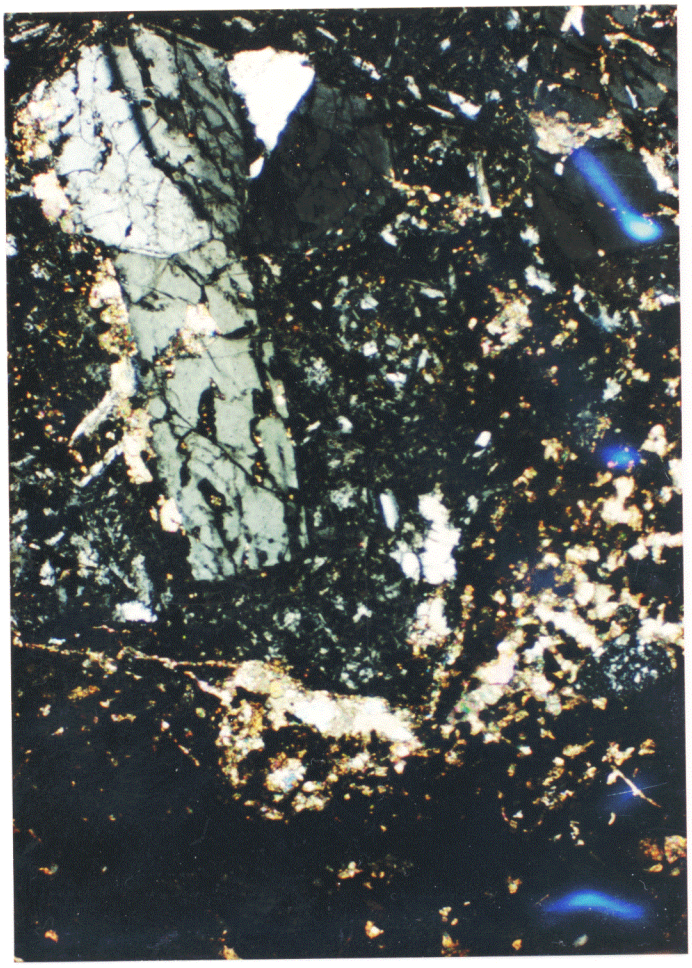
Film: Ektar 125

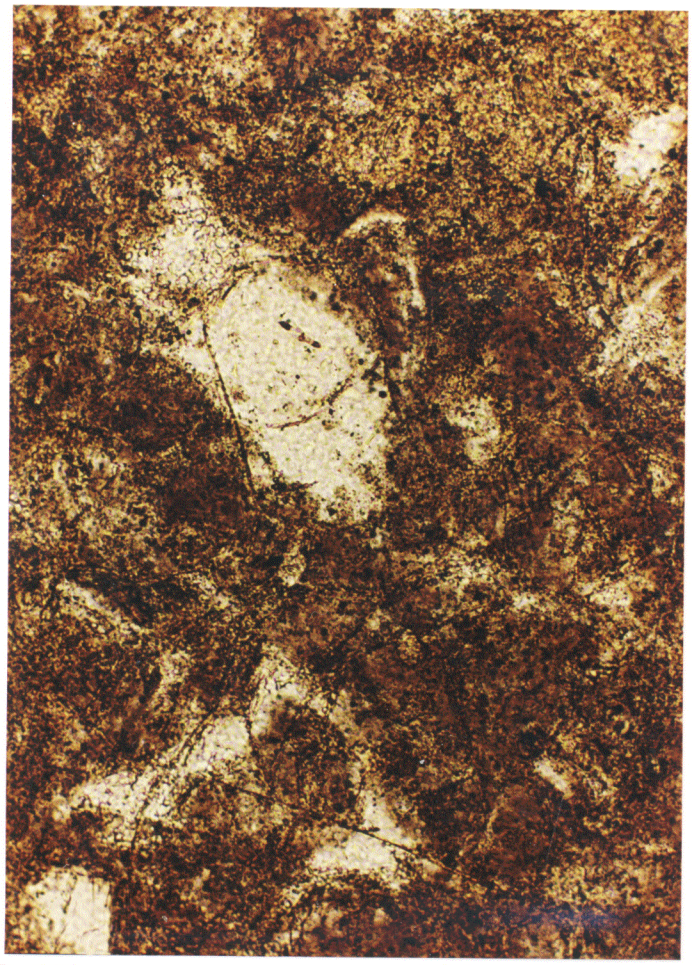
Photo No.	Sample No. and description	Obj.	FOV	Light
	NOP-ECP-2-TS1			
15	VRF + qtz phenocrysts in perlite glass matrix. Notice calcite replacement.	4x	3.0mm	XN
16	Same as #15	4x	3.0mm	PL
17	Calcite replacement in VRF. Groundmass is perlitic glass	4x	3.0mm	XN
18	Same as #17	4x	3.0mm	PL
19	Closeup of devitrification of glass to cryptocrystalline qtz - feldspar.	10x	1.7mm	XN
20	Same as #20.	10x	1.7mm	PL
21	Perlite phenocrysts in a perlite matrix. Also VRF + qtz phenocrysts Calcite fills fractures	4x	3.0mm	XN
22.	Same as #21	4x	3.0mm	PL
23	Plagioclase + perlite phenocrysts in perlitic glass matrix	4x	3.0mm	XN
24	Same as #23	4x	3.0mm	PL

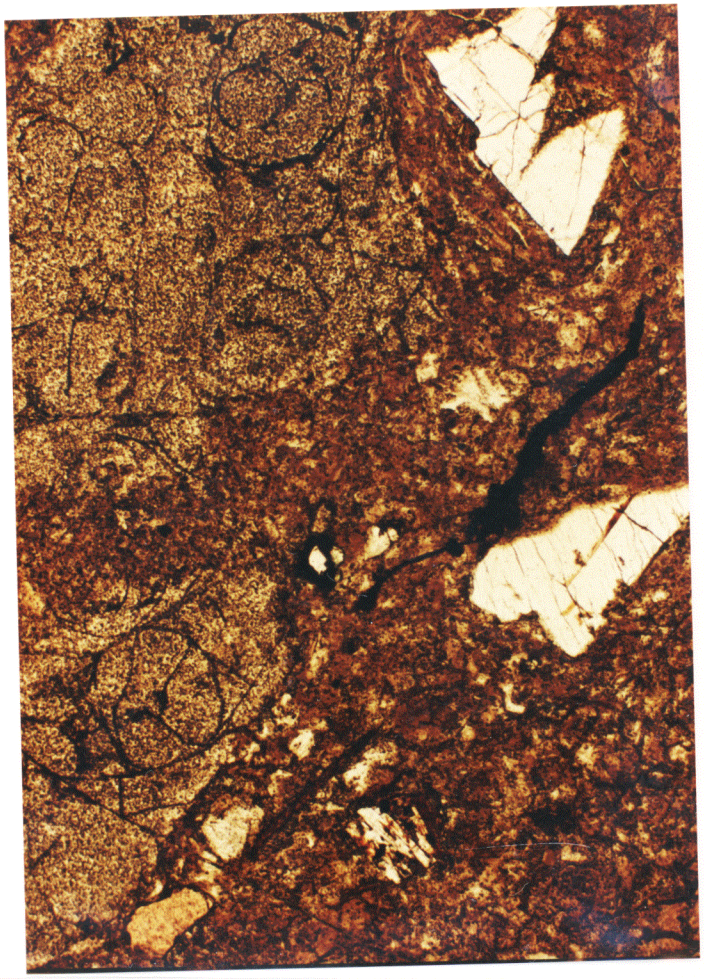


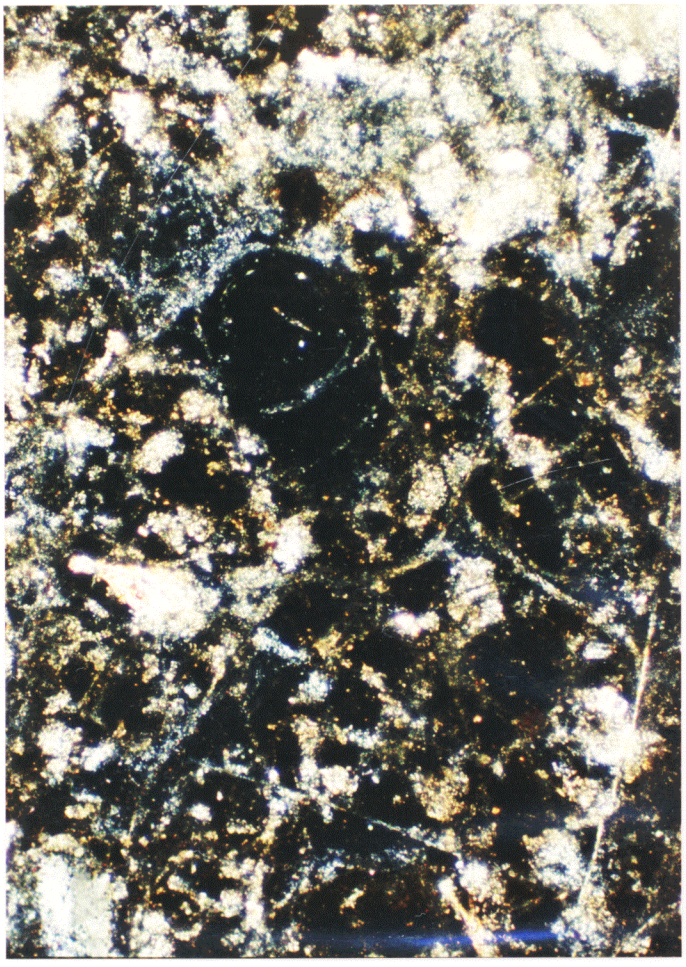


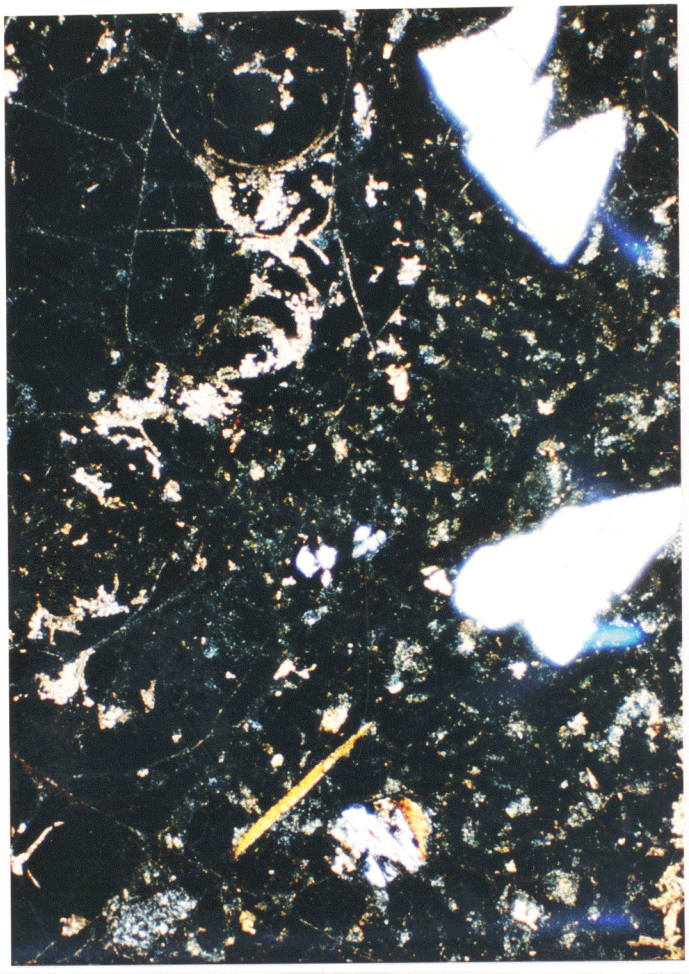


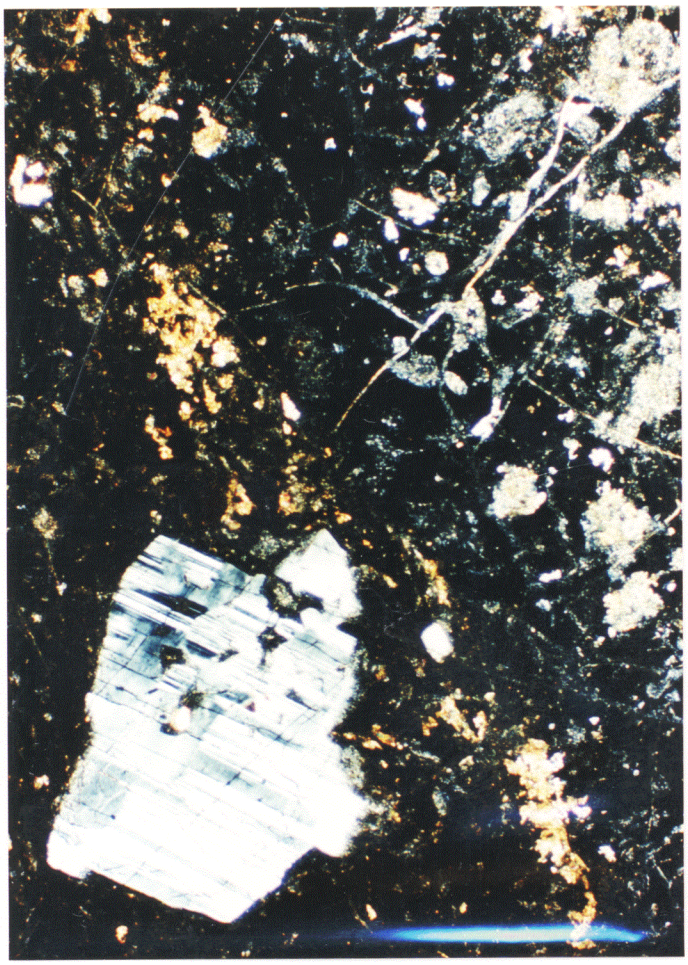












NOPI-ECP-7

PETROGRAPHY

Sample No.: NOPI-ECP-7-TS1

Locality: Sierra Pena Blanca, Chihuahua, Mexico

Formation: Nopal

Classification (rock type): hematitic lithic rhyolite tuff

Matrix or groundmass: 80%

cryptocrystalline qtz-feldspar

fibrous qtz or feldspar or calcite

Grains or crystals: 20%

Phenocrysts:

Qtz - 7%

Feldspar - 10%

Lithoclasts:

VRFS - 3%

Texture or fabric:

Welded, prophyritic, vitroclastic texture preserved.

In plane light ghosts of glass shards present.

Eutaxitic texture - welding + compaction has flattened glass shards more or less parallel to depositional plane.

Alteration/Mineralization:

Devitrification of glass to cryptocrystalline qtz feldspar.

Replacement of glass shards by fibrous qtz-calcite?

Clay replacing feldspar

Volcanic processes or depositional origin:

Air fall.

PETROGRAPHY

Sample No.: NOPI-ECP-7-TS2

Locality: Sierra Pena Blanca, Chihuahua, Mexico

Formation: Nopal

Classification (rock type): hematite lithic rhyolite Tuff

Matrix or groundmass: 80%
cryptocrystalline qtz-feld.
fibrous qtz.

Grains or crystals: 20%
Phenocrysts:
Qtz - 7%
Feld. - 10%

Lithoclasts:
URFs - 3%

Texture or fabric:

Same as NOPI-ECP-7-TS1

Alteration/Mineralization:

Same as NOPI-ECP-7-TS1

Volcanic processes or depositional origin:

Air fall

PHOTOGRAPHY

Photographer: JP

Microscope: Nikon

Type of photography: Standard thin section

Camera: Nikon

Date: 5/3/91

Film: Ektar 125

Photo No.	Sample No. and description	Obj.	FOV	Light
	NOP1-ECP-7-TS1			
1	VRF + altered fld in hematitic devitrified groundmass. Notice Eutaxitic texture of groundmass	4X	3.0mm	XN
2	Same as #1	4X	3.0mm	PL
3	Groundmass shows remnant glass shards + cryptocrystalline qtz-feldspar	4X	3.0mm	XN
4	Same as #3. Notice Eutaxitic texture	4X	30mm	PL
5	Closup of VRF in hematitic devitrified groundmass	10X	1.7mm	XN
6	Same as #5. Eutaxitic texture.	10X	1.7mm	PL

PHOTOGRAPHY

Photographer: JP

Microscope: Nikon

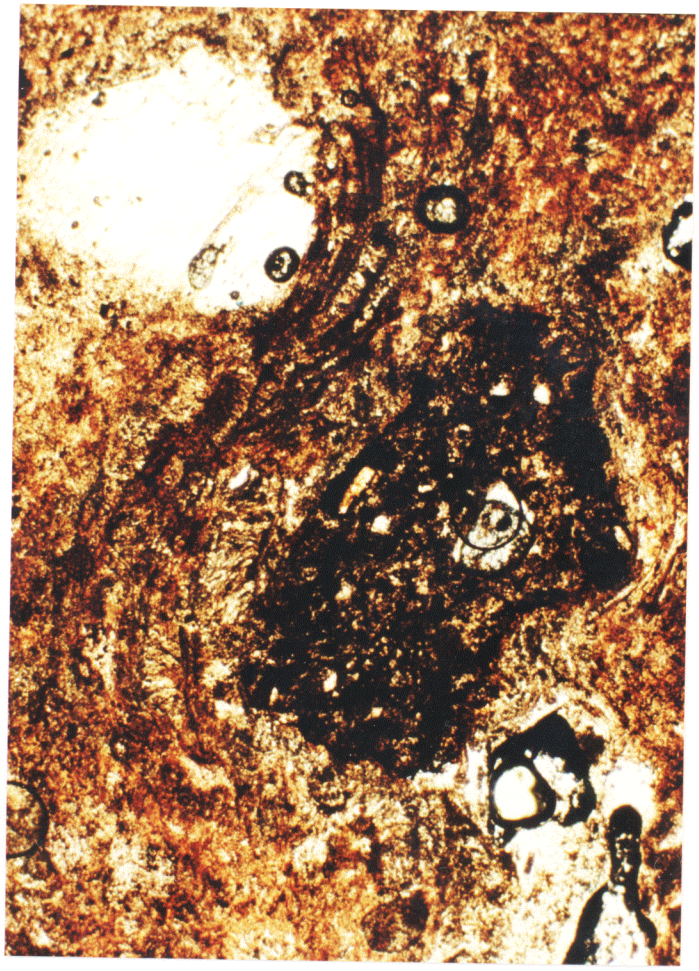
Type of photography: Standard thin section

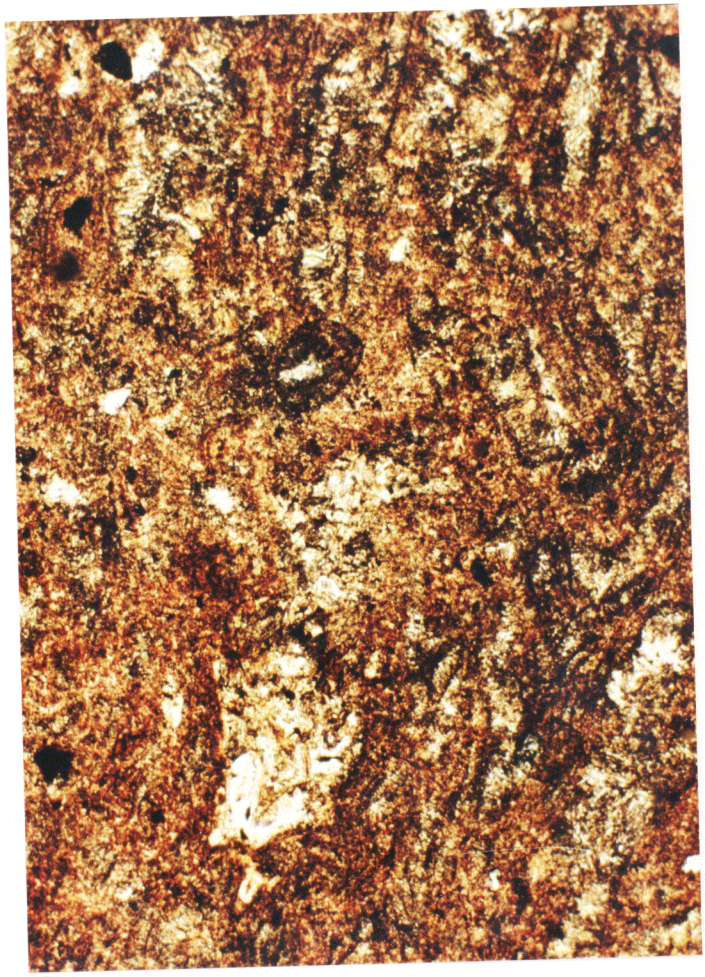
Camera: Nikon

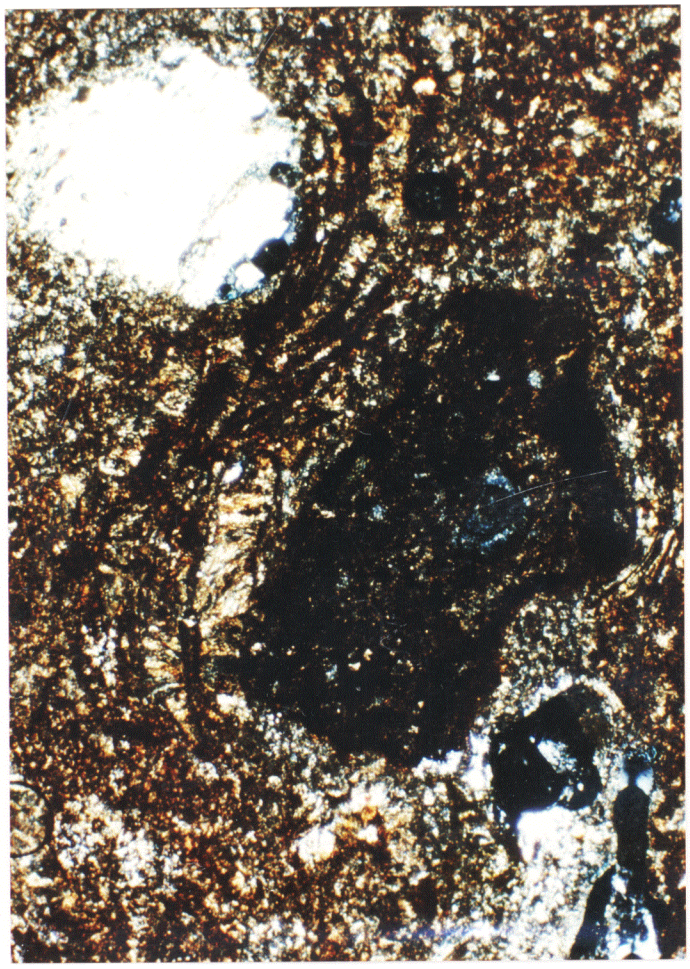
Date: 5/3/91

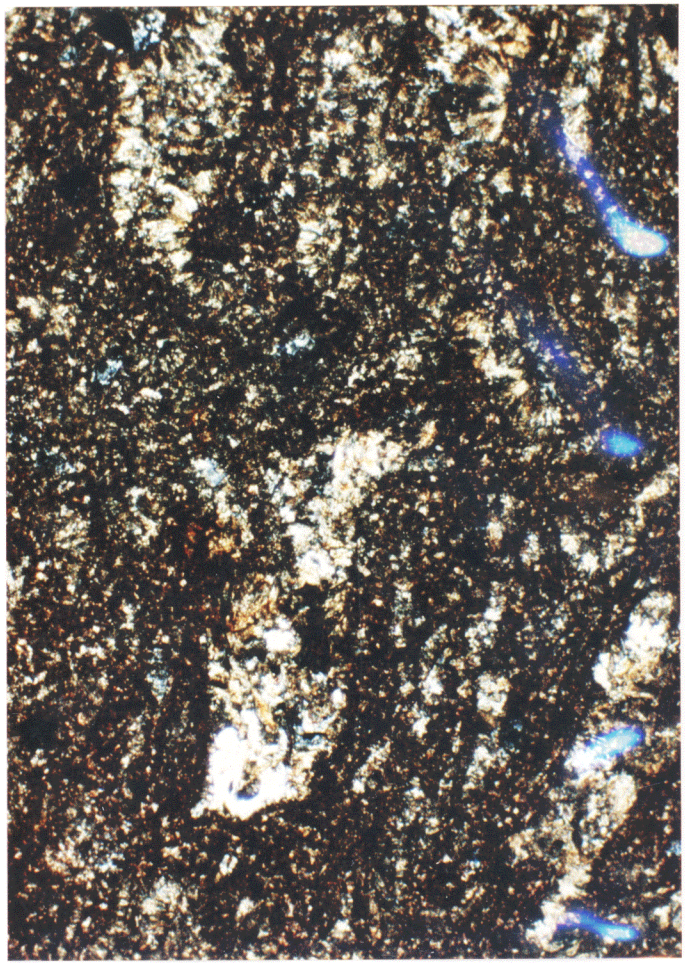
Film: Ektar 125

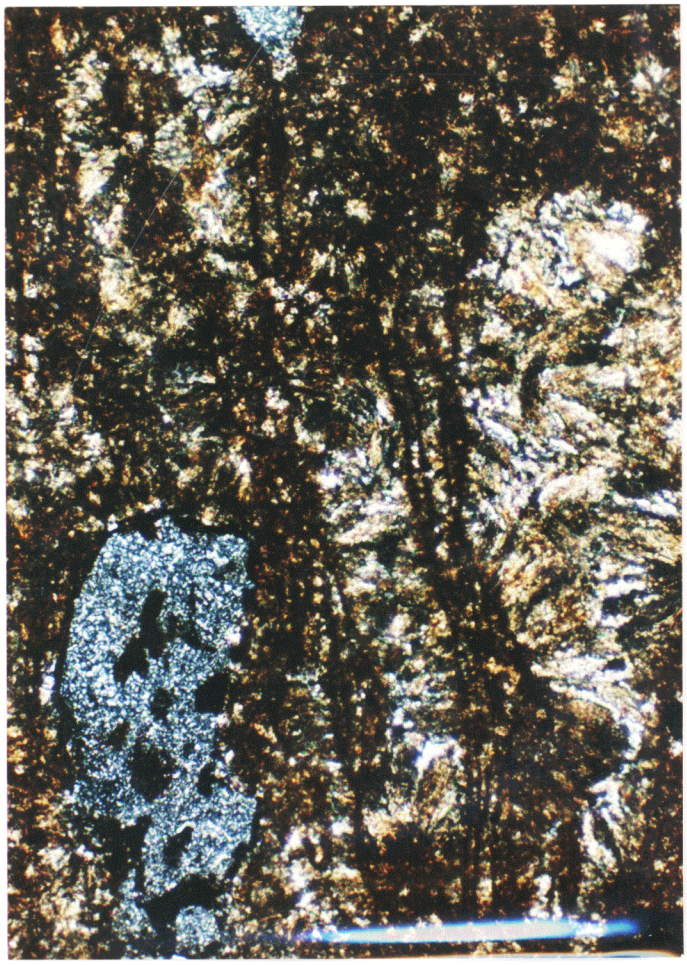
Photo No.	Sample No. and description	Obj.	FOV	Light
	NOPI-ECP-7-TS2			
7	VRFs or clay-replaced Sld. rimmed by hematite in a hematite devitrified groundmass.	10X	1.7mm	XN
8	Same as #7	10X	1.7mm	PL
9	Clump of fibrous mineral(s) in groundmass (qtz or calcite) Hematite, Euhedral Tuffs	10X	1.7mm	XN
10	Another clump as above	10X	1.7mm	XN
11	Clay replacing a feldspar	10X	1.7mm	XN
12	Same as #11	10X	1.7mm	PL

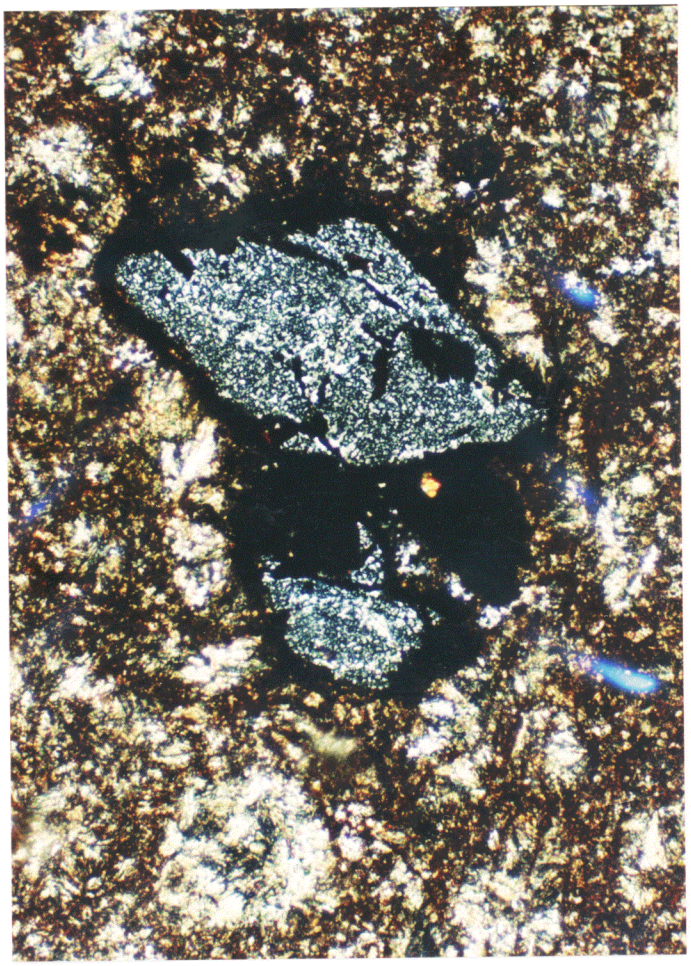


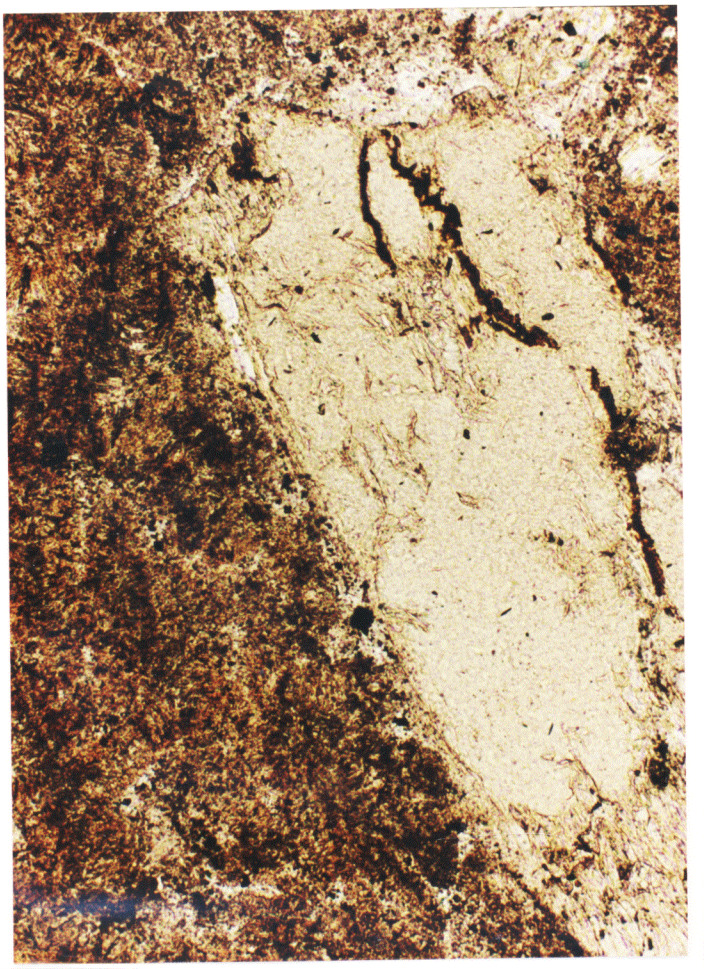


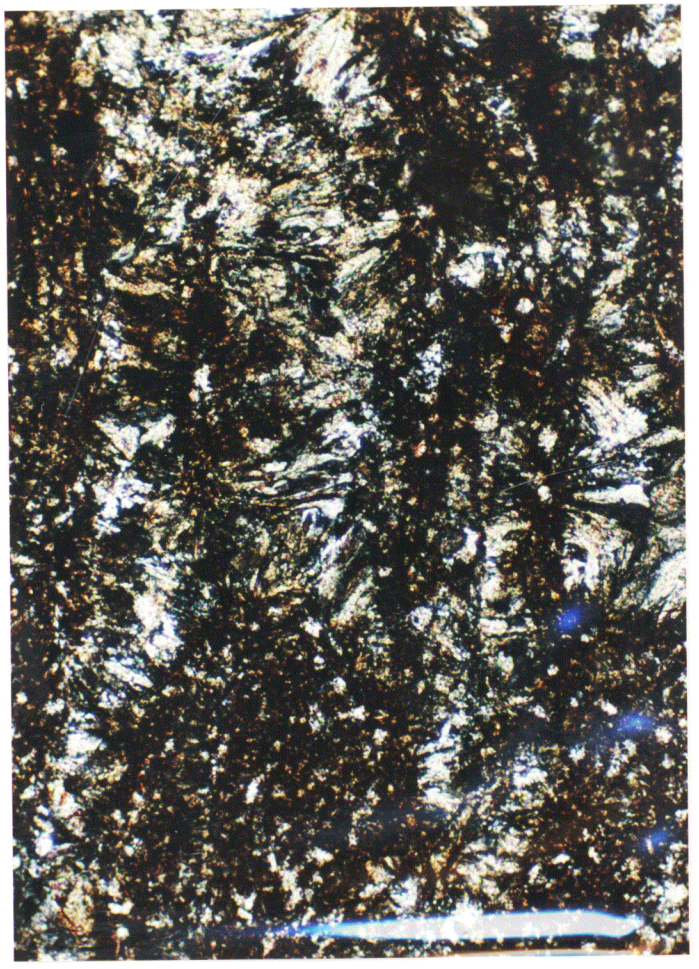


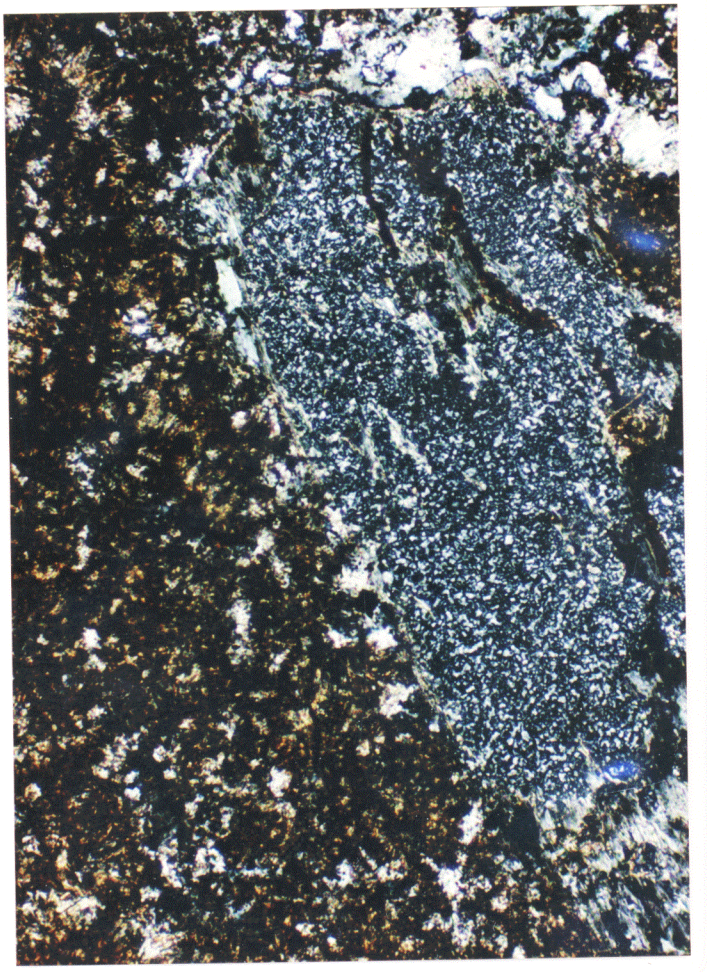












NOPI-ECP-8

PETROGRAPHY

Sample No.: NOPI-ECP-8-TS1

Locality: Sierra Pena Blanca, Chihuahua, Mexico

Formation: Nopal

Classification (rock type): hematitic rhyolite tuffs.

Matrix or groundmass: 80%

Cryptocrystalline qtz-feldspar
radiating-fibrous qtz-feldspar

Grains or crystals: 20%

Phenocrysts:

Qtz - 10%
Feld. - 10%

Lithoclasts:

VRFs. - < 1%

Texture or fabric:

Porphyritic, welded, vitroclastic texture destroyed by devitrification

Alteration/Mineralization:

Devitrification of glass to cryptocrystalline qtz-feld and radiating-fibrous qtz-feldspar.
Appear feldspars have been altered to clay or microcrystalline qtz.

Volcanic processes or depositional origin:

Air fall.

PETROGRAPHY

Sample No.: NOPI-ECP-8-TS2

Locality: Sierra Para Blanca, Chihuahua, Mexico

Formation: Nopal

Classification (rock type): hematite rhyolite tuff

Matrix or groundmass: 80%

Grains or crystals: 20%

Phenocrysts:

Lithoclasts:

Texture or fabric:

Same as NOPI-ECP-8-TS1

Alteration/Mineralization:

Same as NOPI-ECP-8-TS1

Volcanic processes or depositional origin:

Air fall.

PHOTOGRAPHY

Photographer: MP

Microscope: Nikon

Type of photography: Standard thin section

Camera: Nikon

Date: 5/3/91

Film: Ektar 125

Photo No.	Sample No. and description	Obj.	FOV	Light
	NOP1-ECP-8-TS1			
13	~~Otherwise~~ Quartz phenocrysts in groundmass of cryptocrystalline qtz-feldspar + radiating feldspar	4X	3.mm	XN
14	Same as #13.	4X.	3.0mm	PL
15	Closeup of matrix - cryptocrystalline qtz-feld, radiating minerals. Hematite.	10X	1.7mm	XN
16	Same as #15	10X	1.7mm	PL
17.	Close up of clay or microcrystalline qtz replaced feldspar.	10X	1.7mm	XN
18	Same as #17	10X	1.7mm	PL

PHOTOGRAPHY

Photographer: JP

Microscope: Nikon

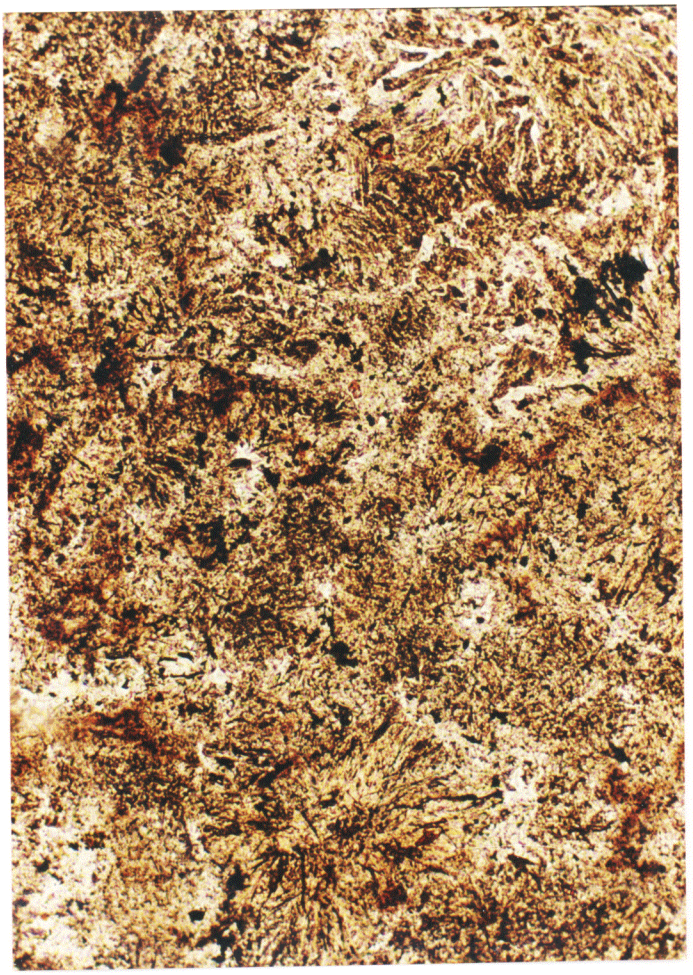
Type of photography: Standard Thin Section

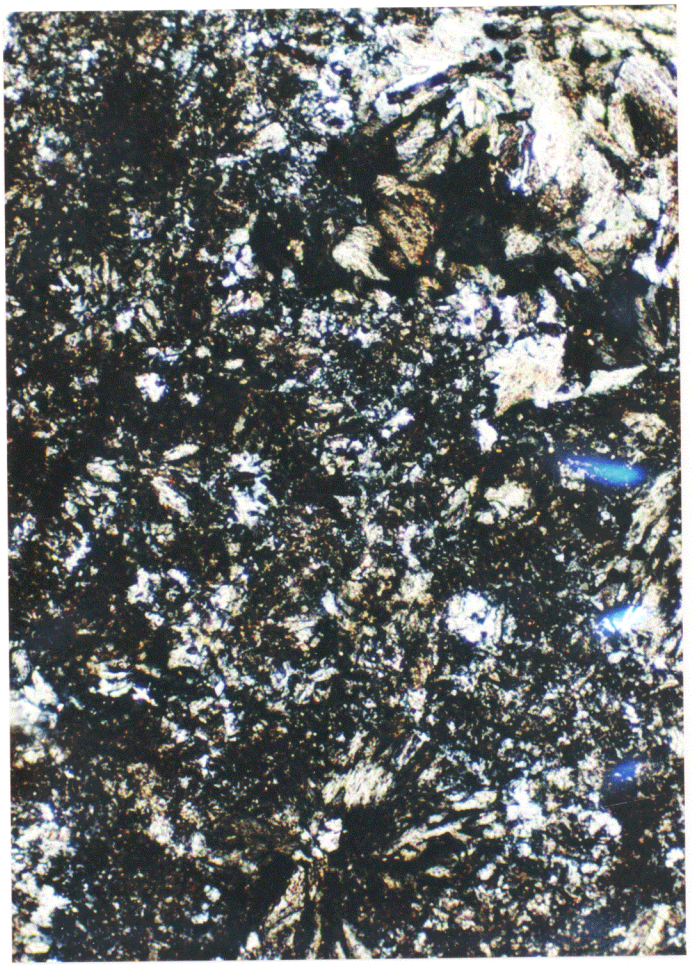
Camera: Nikon

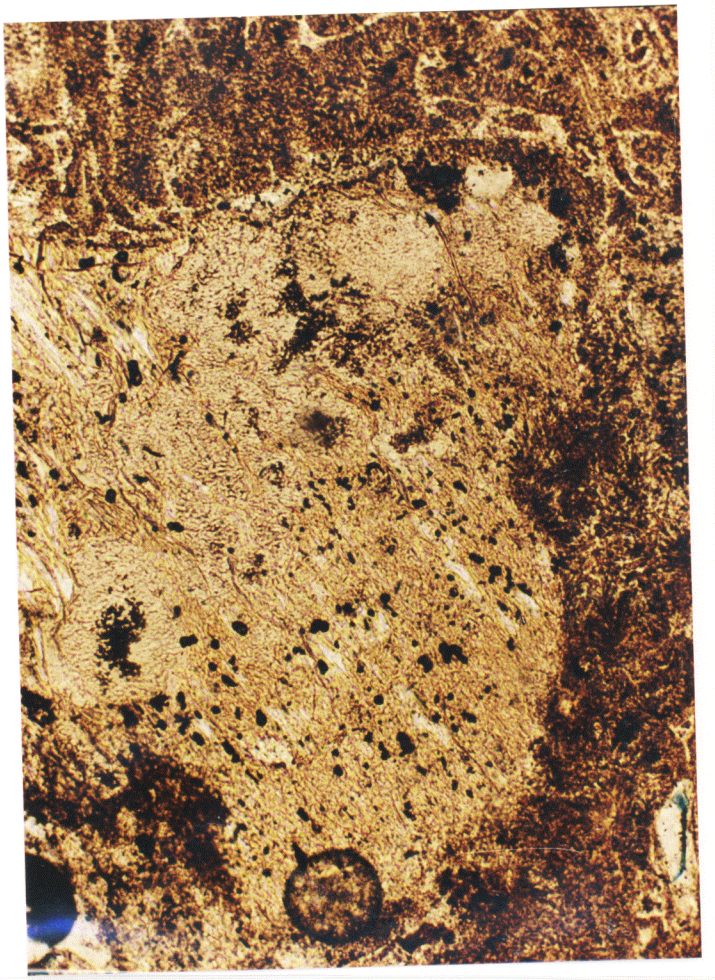
Date: 5/3/91

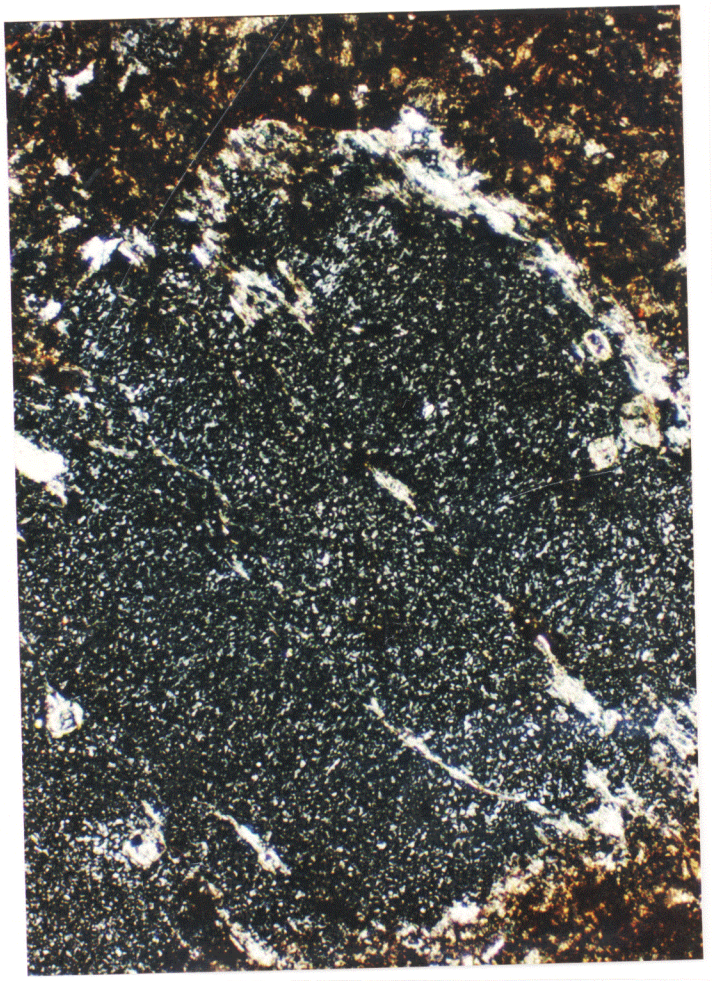
Film: Ektar 125

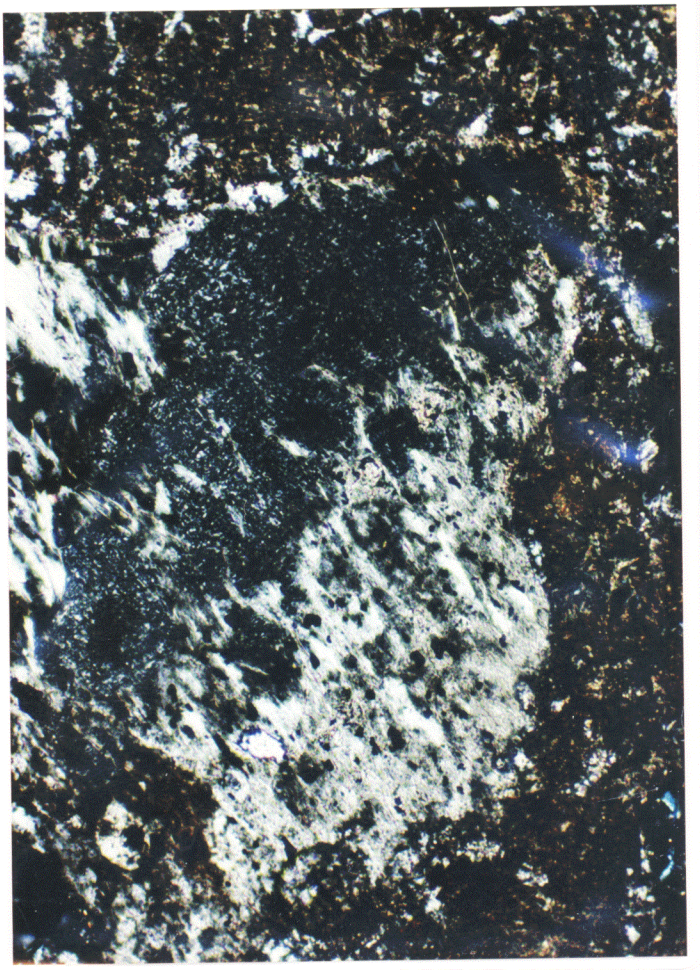
Photo No.	Sample No. and description	Obj.	FOV	Light
	NOPI-ECP-8-T52			
19	Feldspar being replaced by clay or microcrystalline qtz	10x	1.7mm	XN
20	Same as #19	10x	1.7mm	PL
21	Altered feldspar phenocrysts in devitrified groundmass	4x	3.0mm	XN
22	Same as #21	4x	3.0mm	PL
23	Altered phenocrysts in devitrified groundmass	4x	3.0mm	XN
24	Same as #23	4x	3.0mm	PL

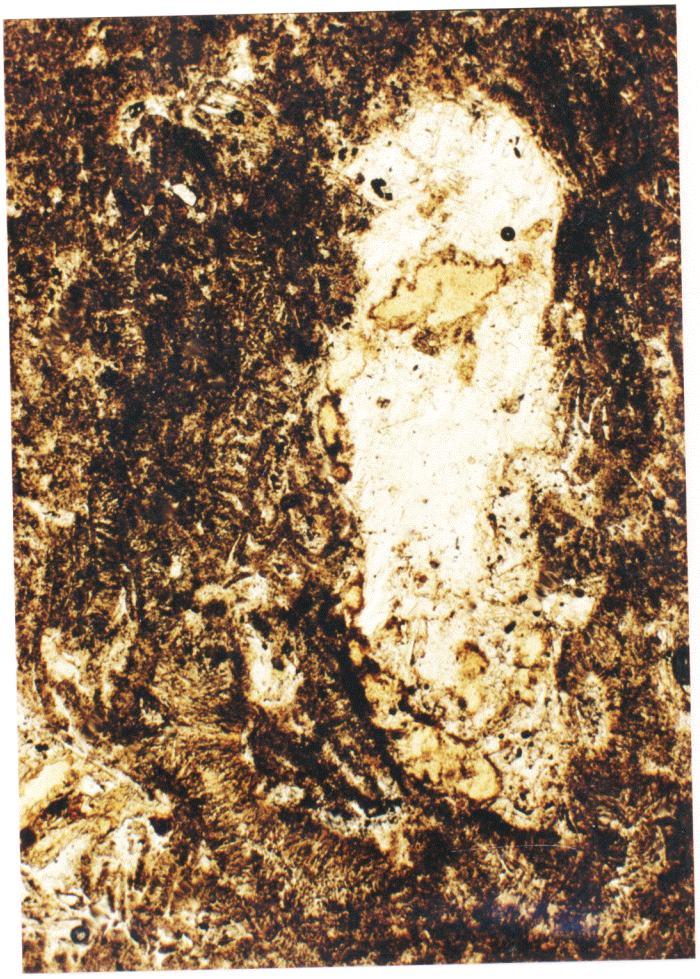












PETROGRAPHY

Sample No.:

Locality:

Formation:

Classification (rock type):

Matrix or groundmass:

Grains or crystals:

Phenocrysts:

Lithoclasts:

Texture or fabric:

Alteration/Mineralization:

Volcanic processes or depositional origin:

PETROGRAPHY

Sample No.:

Locality:

Formation:

Classification (rock type):

Matrix or groundmass:

Grains or crystals:

Phenocrysts:

Lithoclasts:

Texture or fabric:

Alteration/Mineralization:

Volcanic processes or depositional origin:

PETROGRAPHY

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Lithoclasts:

Texture or fabric:

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PETROGRAPHY

Sample No.:

Locality:

Formation:

Classification (rock type):

Matrix or groundmass:

Grains or crystals:

Phenocrysts:

Lithoclasts:

Texture or fabric:

Alteration/Mineralization:

Volcanic processes or depositional origin:

PETROGRAPHY

Sample No.:

Locality:

Formation:

Classification (rock type):

Matrix or groundmass:

Grains or crystals:

Phenocrysts:

Lithoclasts:

Texture or fabric:

Alteration/Mineralization:

Volcanic processes or depositional origin:

PETROGRAPHY

Sample No.:

Locality:

Formation:

Classification (rock type):

Matrix or groundmass:

Grains or crystals:

Phenocrysts:

Lithoclasts:

Texture or fabric:

Alteration/Mineralization:

Volcanic processes or depositional origin:

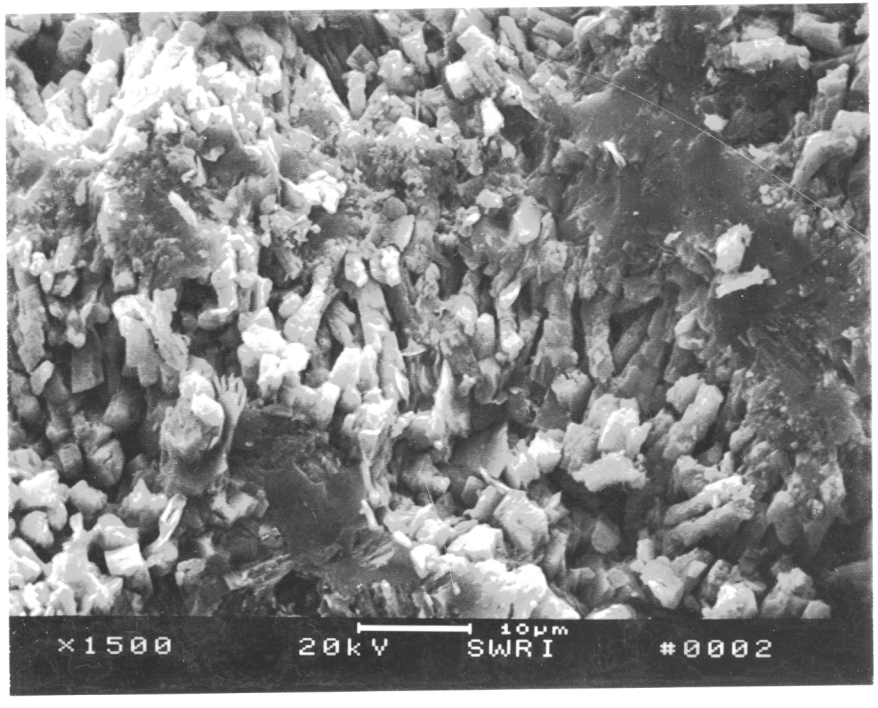
PHOTOGRAPHY

Photographer: Microscope:

Type of photography: Camera:

Date: Film:

Photo No.	Sample No. and description	Obj.	FOV	Light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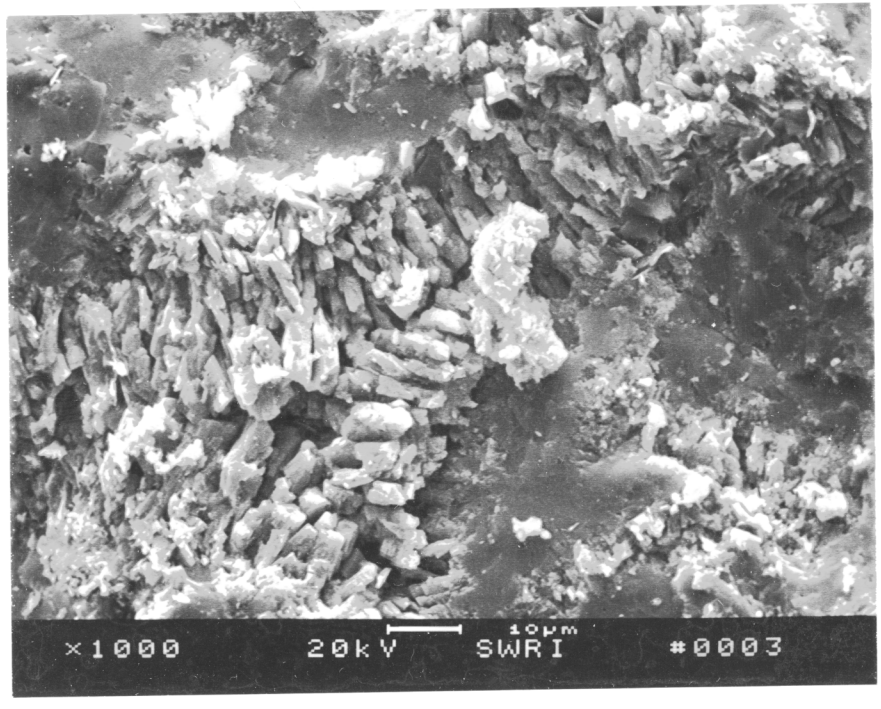
20kV
10μm
SWRI
#0002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10μm
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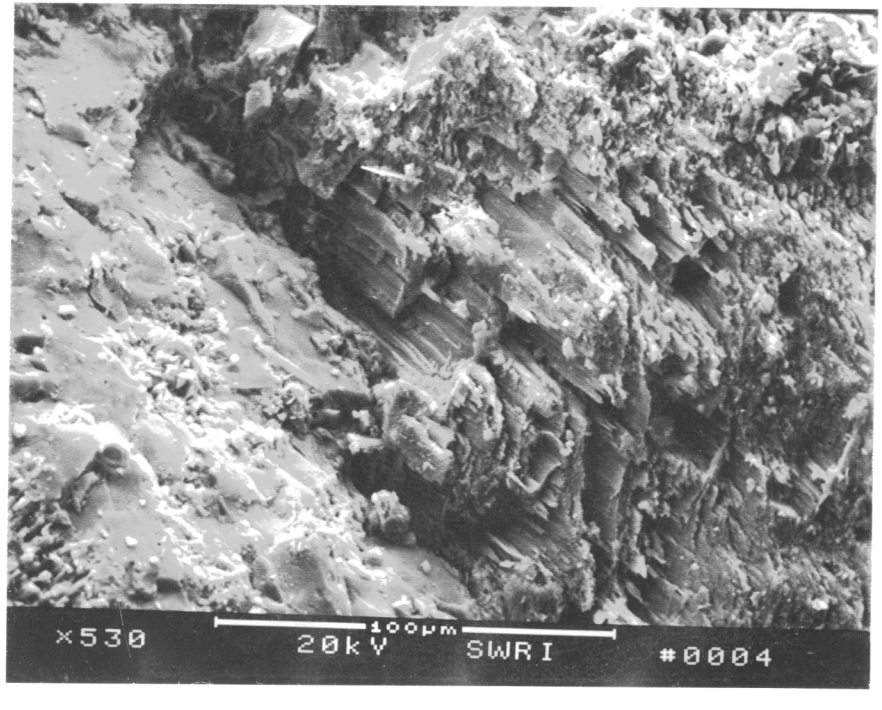
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Series II Southwest Research Institute WED 26-JUN-91 07:51

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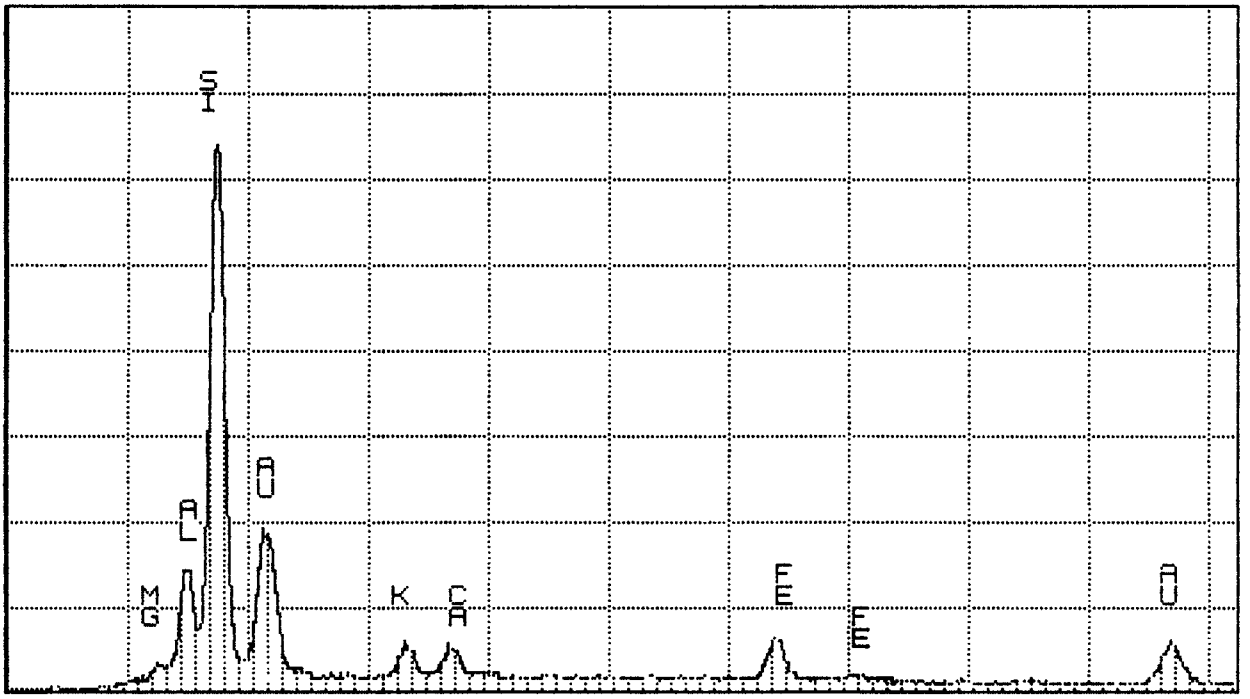

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101 PB1 20KV, WD=18

Series II Southwest Research Institute WED 26-JUN-91 07:50
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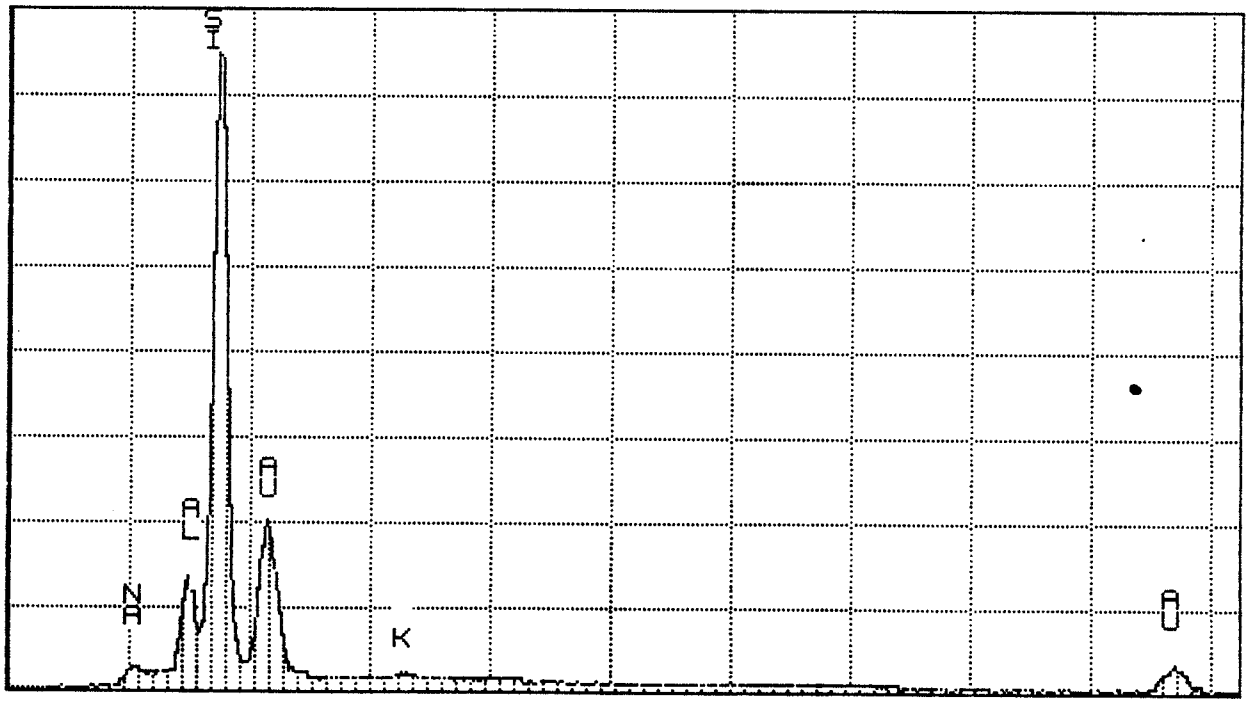

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99 CDV2 20KV, WD=26

Series II Southwest Research Institute WED 26-JUN-91 07:48
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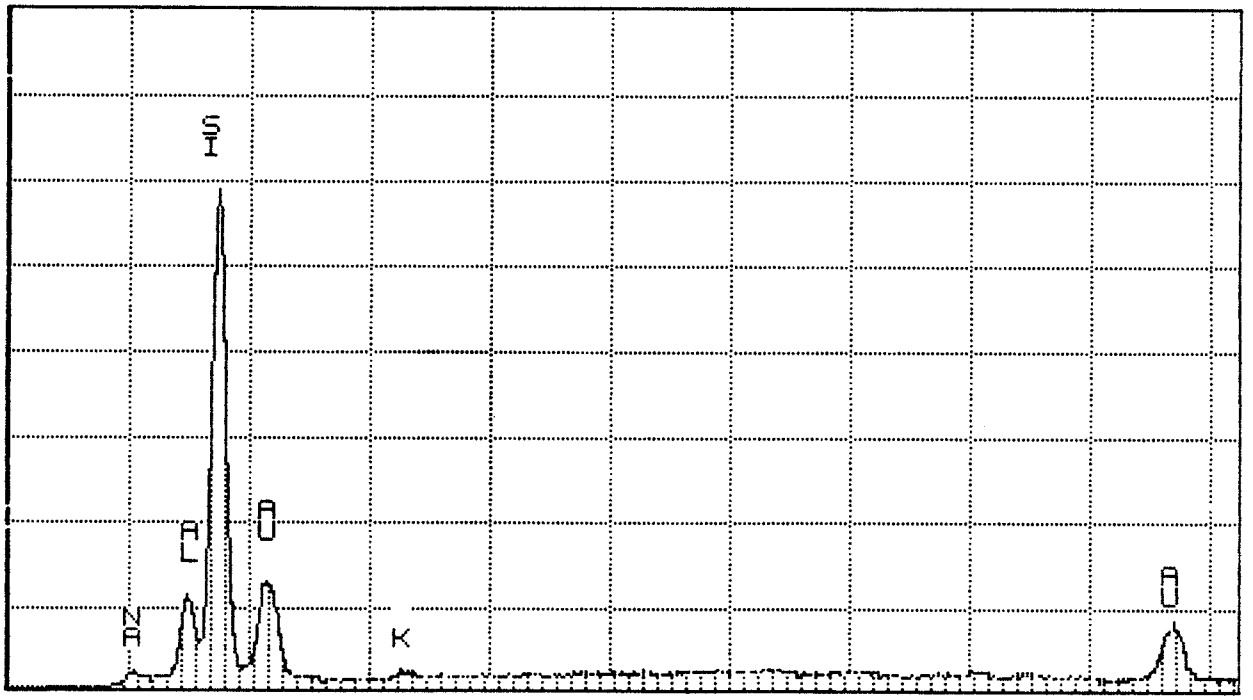
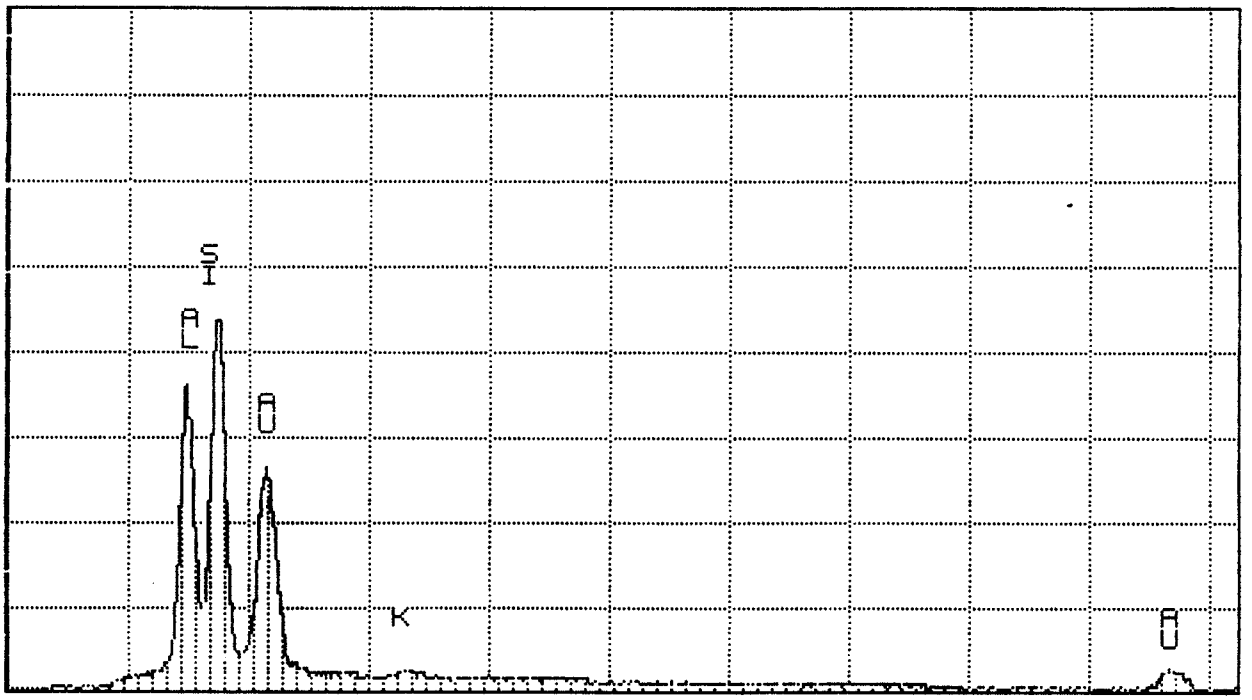


0.000 VFS = 2048 10.240
100 CDV1 20KV, WD=26

Series II Southwest Research Institute WED 26-JUN-91 07:47

Cursor: 0.000keV = 0



0.000 VFS = 2048 10.240

99 ESC3

Series II Southwest Research Institute WED 26-JUN-91 07:45

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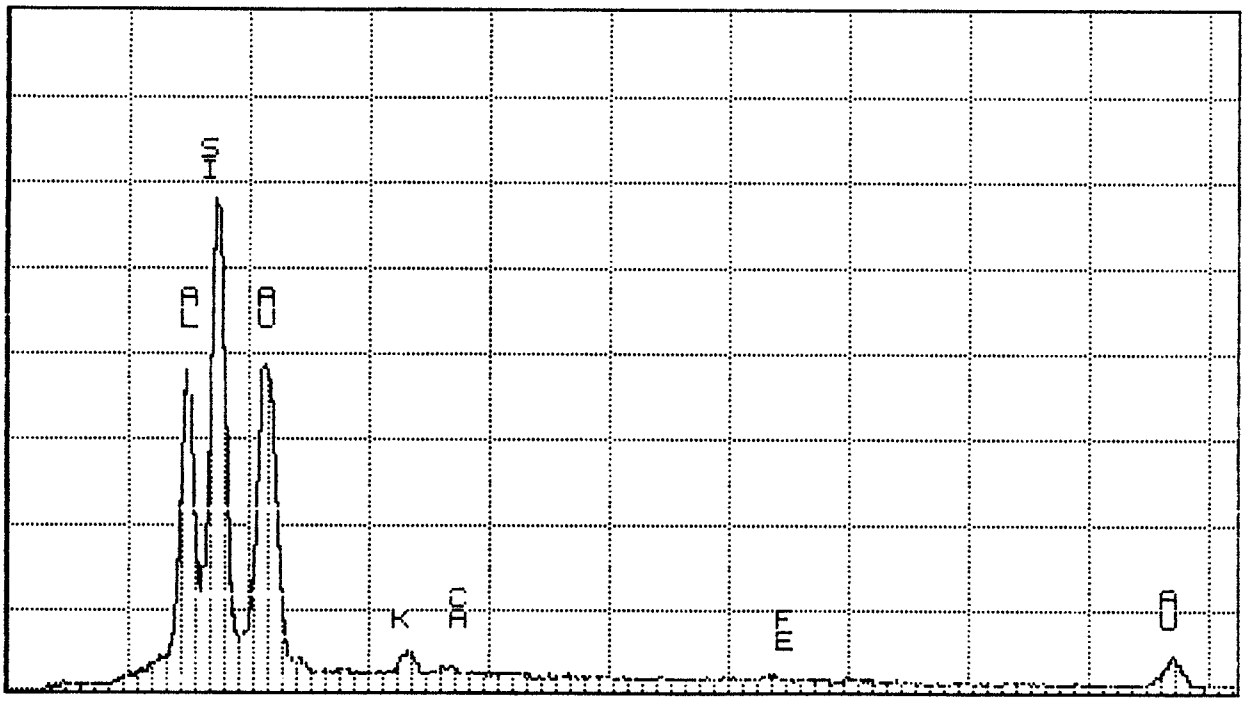

0.000 VFS = 2048 10.240

123 ESC2

Series II Southwest Research Institute WED 26-JUN-91 07:44

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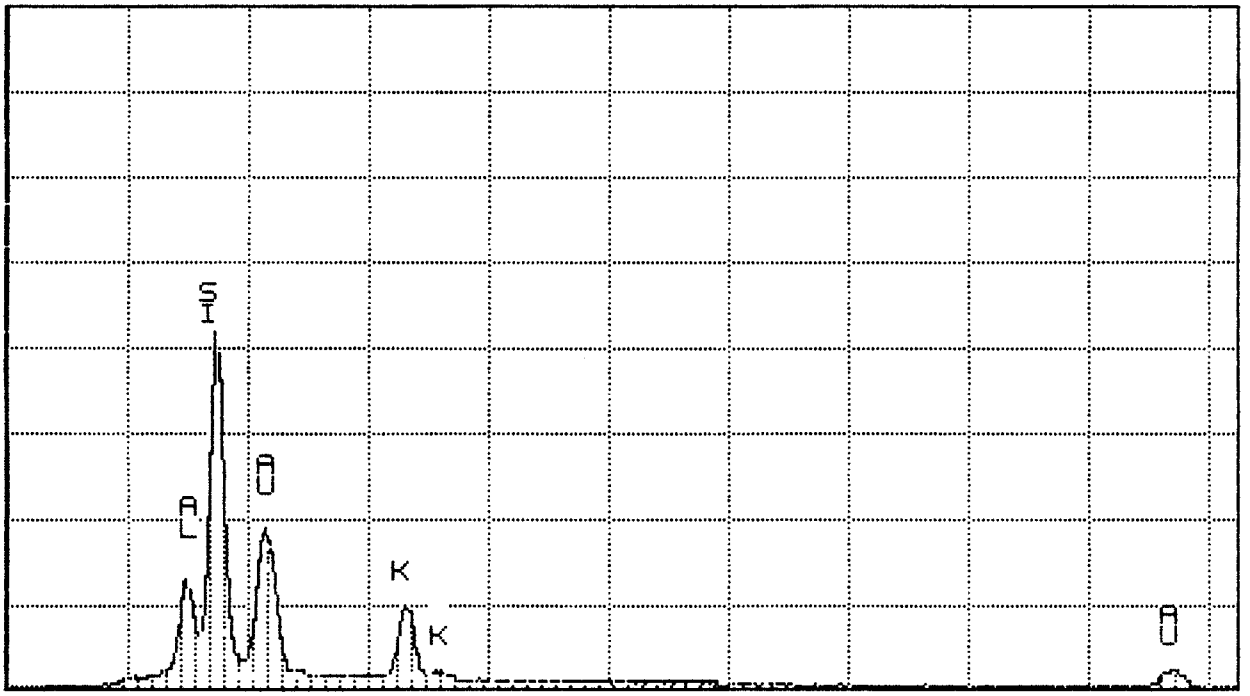
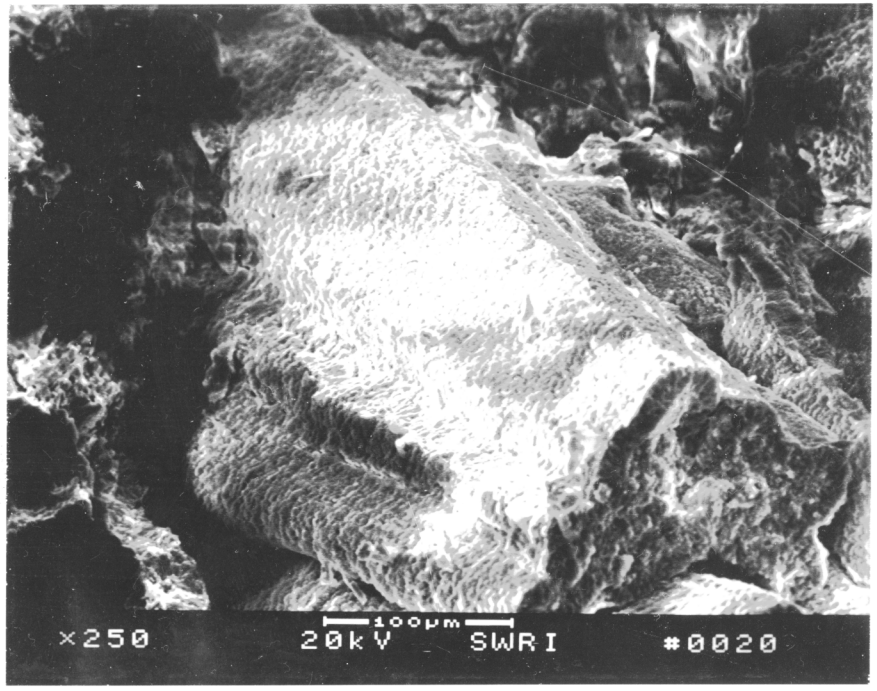


0.000 VFS = 4096 10.240

103 ESC1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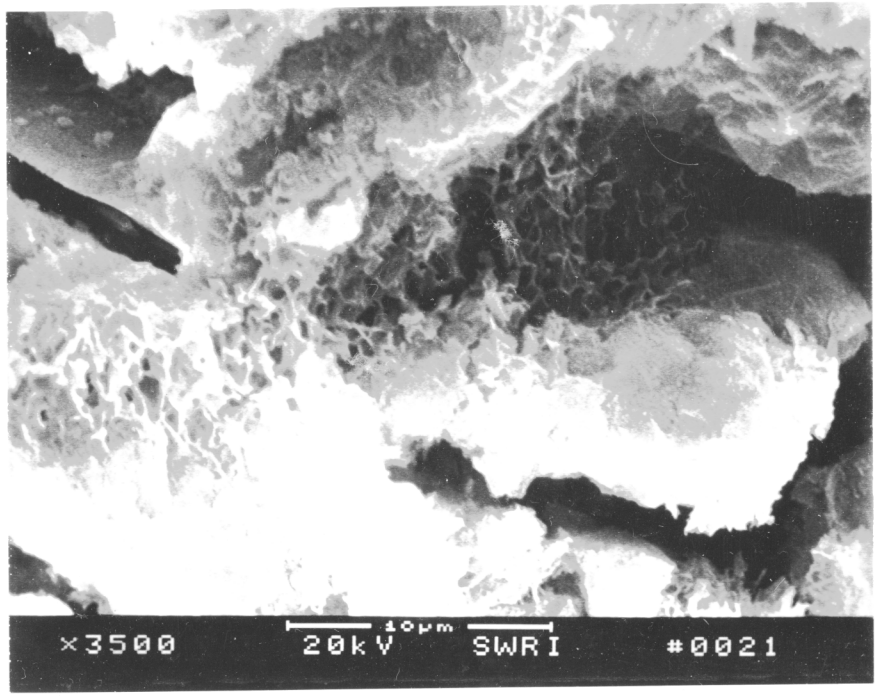
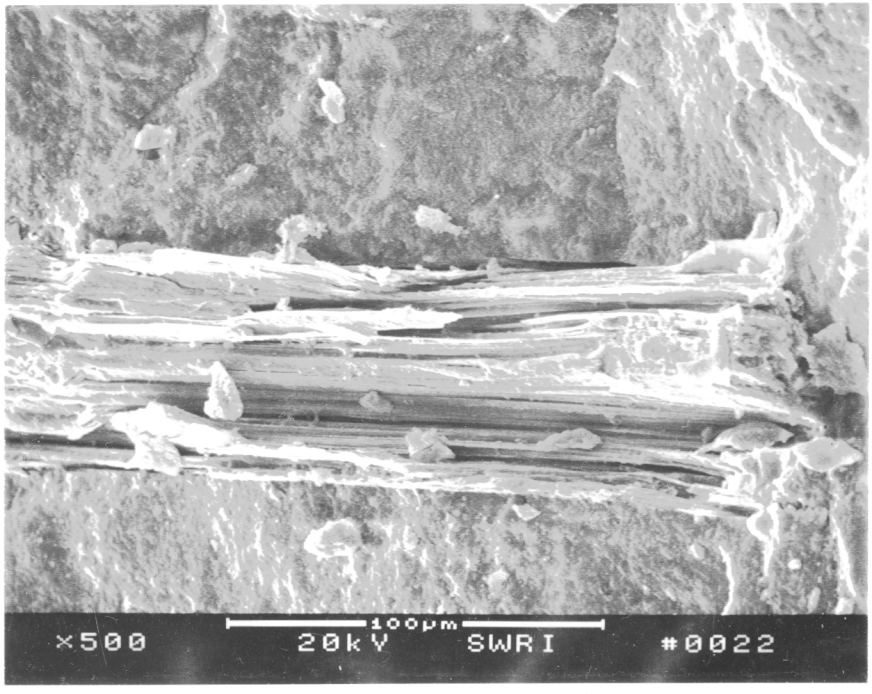
100μm
20kV
SWRI
#0020


×3500
10μm
20kV
SWRI
#0021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100μm
20kV
SWRI
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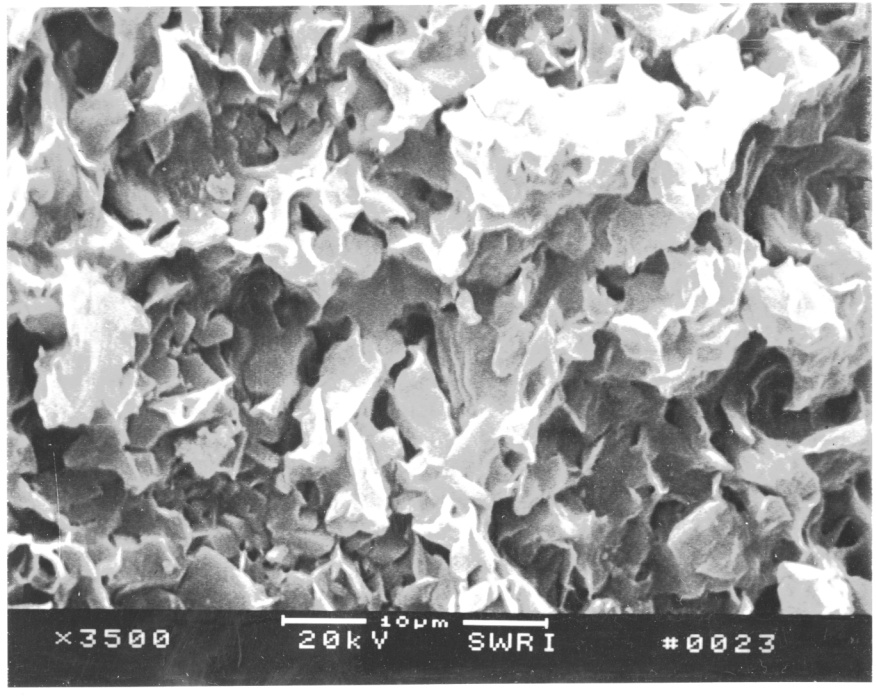
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20kV
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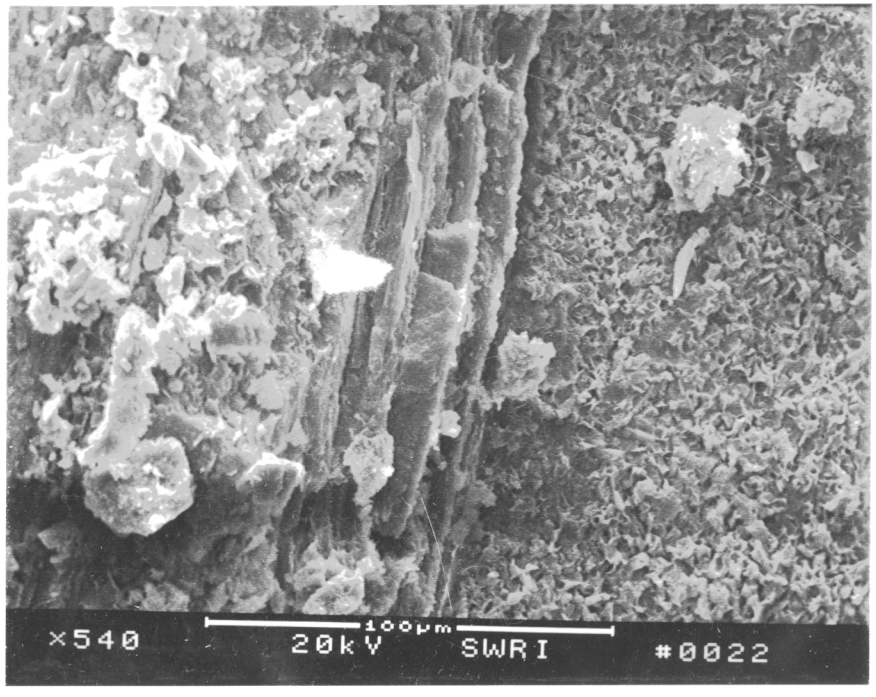
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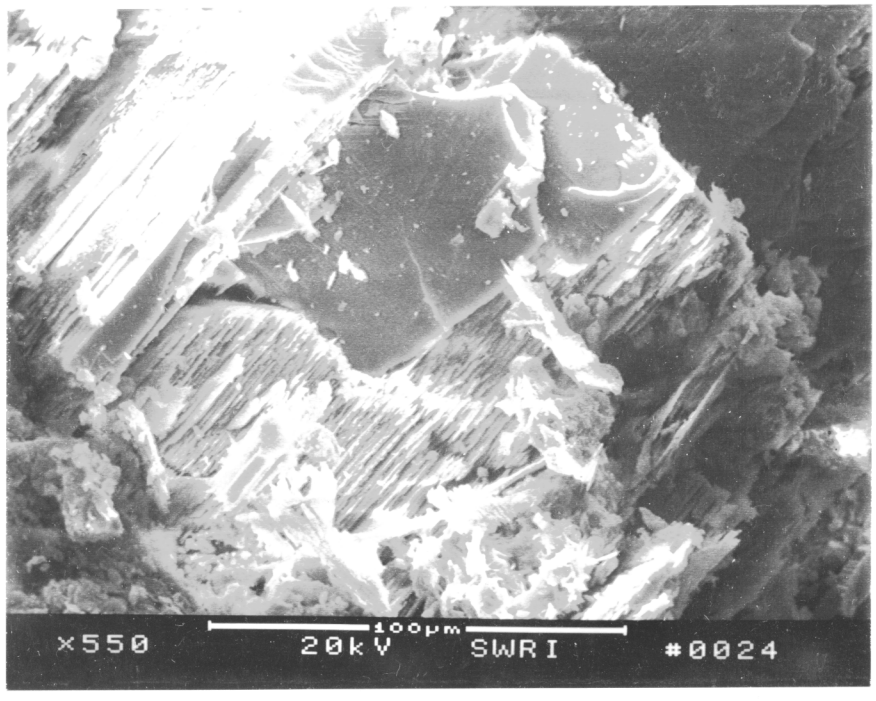
SWRI
#0022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100μm
20kV
SWRI
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