

GMF 45-36

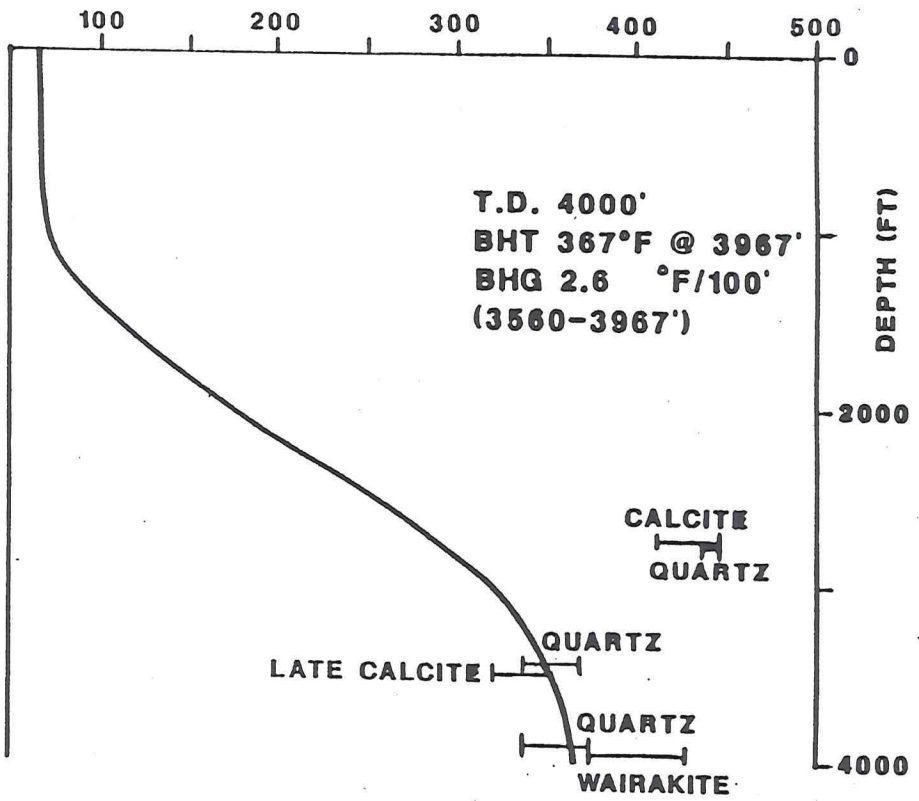
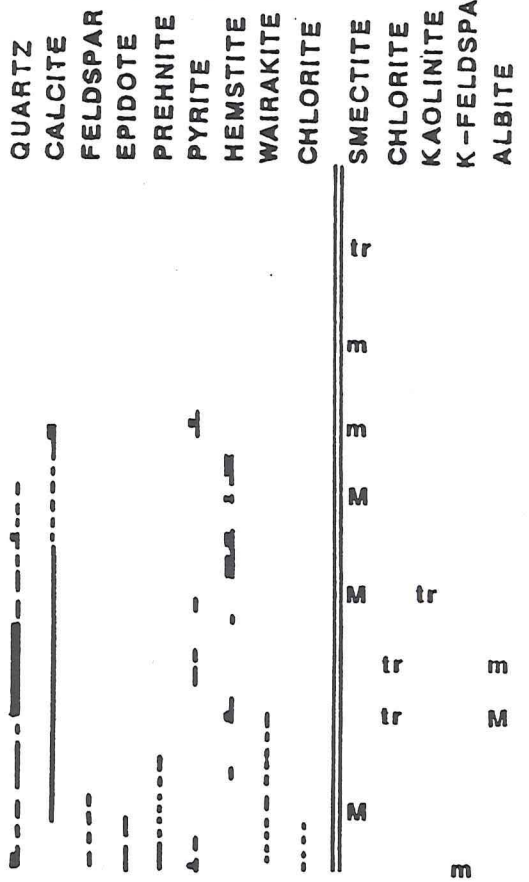
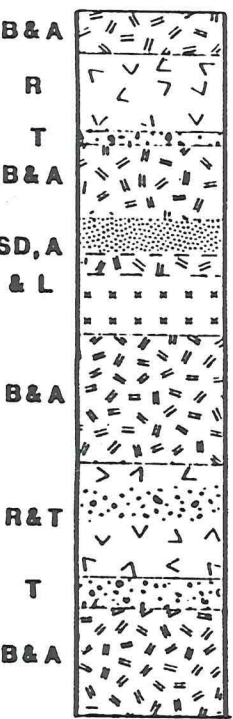
LITHOLOGY

ALTERATION ZONE

LOGGED SECONDARY MINERALS

XRD MINERALOGY

TEMPERATURE (°F)



ROCK KEY

- B BASALT
- A ANDESITE
- D DACITE
- R RHYOLITE
- T TUFF
- L LAHARS
- SD SEDIMENTS

ALTERATION ZONES

- Z-S ZEOLITE-SMECTITE
 - A ARGILLIC
 - P PROPYLITIC
- FLUID INCLUSION
— HOMOGENIZATION
— TEMPERATURES.

- ABUNDANT
- - - COMMON
- · · TRACE
- · · RARE

- M MAJOR (15-50%)
- m MINOR (3-15%)
- tr TRACE (1-3%)

CONFIDENTIAL

Figure 7

D.I.C.10/87

MICROSCOPE WORK

45-36

Andesite Flow

100

no alteration - 0

< 2% cpx + plag + magnetite

groundmass - micro. +

45-36

36°

dacite
~~rhyncholite?~~
andesite

dehydrating

alter. 2 (some alteration)
pyx

pleno

plag

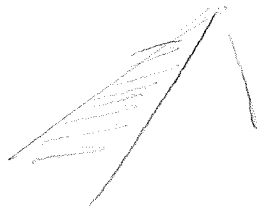
~~opx~~

opx - few, elongate, pleochroic, fresh
contain fluid inclusions

apatite - dr in plag

FeOx

rare zeolite filling



45-36

480

dehydrifys

~~quartzite~~ ^{ryholite} ~~quartzite~~ ^{quartzite}

dehydrified clots

labeled rhy-

dominates

plag

cp &
OPX -

pleo., fluid incl. brack

bio -

trace

or smectite - pleochroic

apatite C.S.; elongate phenos.

clot with granophyric texture

dark green cpx? - elongated
plag

dark rims on many ppx stals

45-36

~~600~~ rhyolite dacite

andesite

glassy flow

unaltered - 0

plag (containing glass inclusions)

>> opx

apatite

no obvious cpx

45-36

850

~~buff~~ ?

can tell we have:

phos 10%
plag - broken

alteration (groundmass)

apatite (very pleochroic) dr

3-5

px - pleo dr

partly altered to
smectite / chl

45-36

870

basaltic tuff (pyroclastic)

Fragments of basalt.

Some vugs just lined
with zeol.

plag generally fine

some ~~plag~~^{oliv?} altered to clays
in lens

FeOx common

A14

2-3

45-36

1000

andesite

phenocryst rich > 65% - 75%

plag

Alter -

cpx

some chl or chl/smec

altered opx?

2-3

2 mafic minerals.

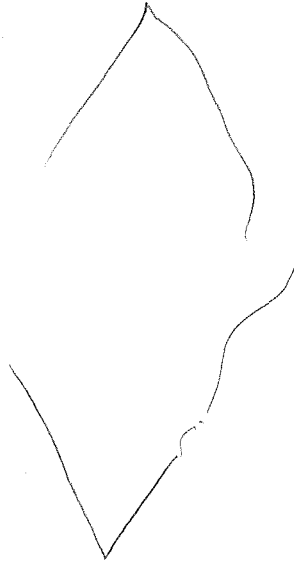
cpx >> opx

45-36

1100

alter-

Chlor
overall 2 except
for olivine



Phenocr $> 50\%$

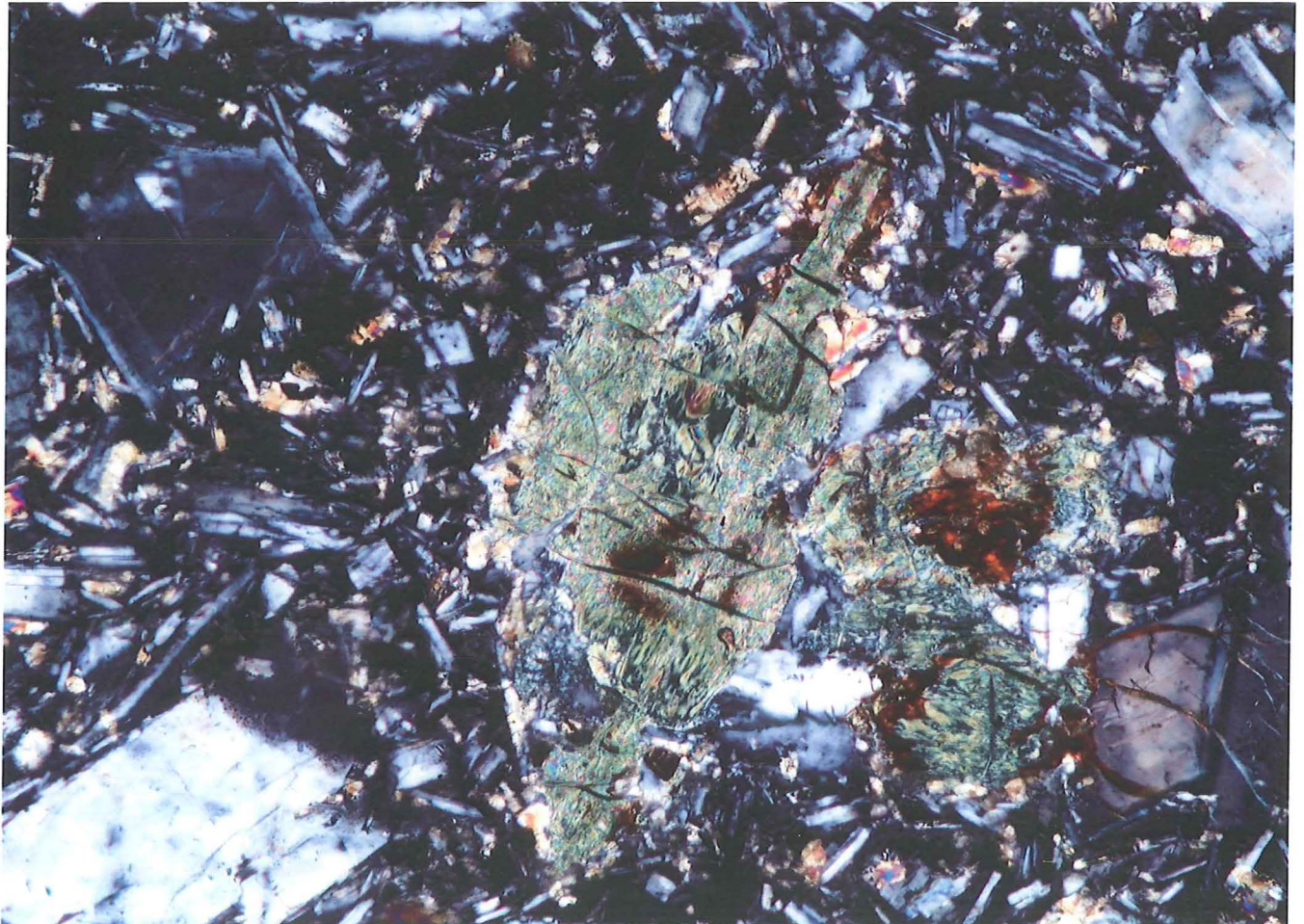
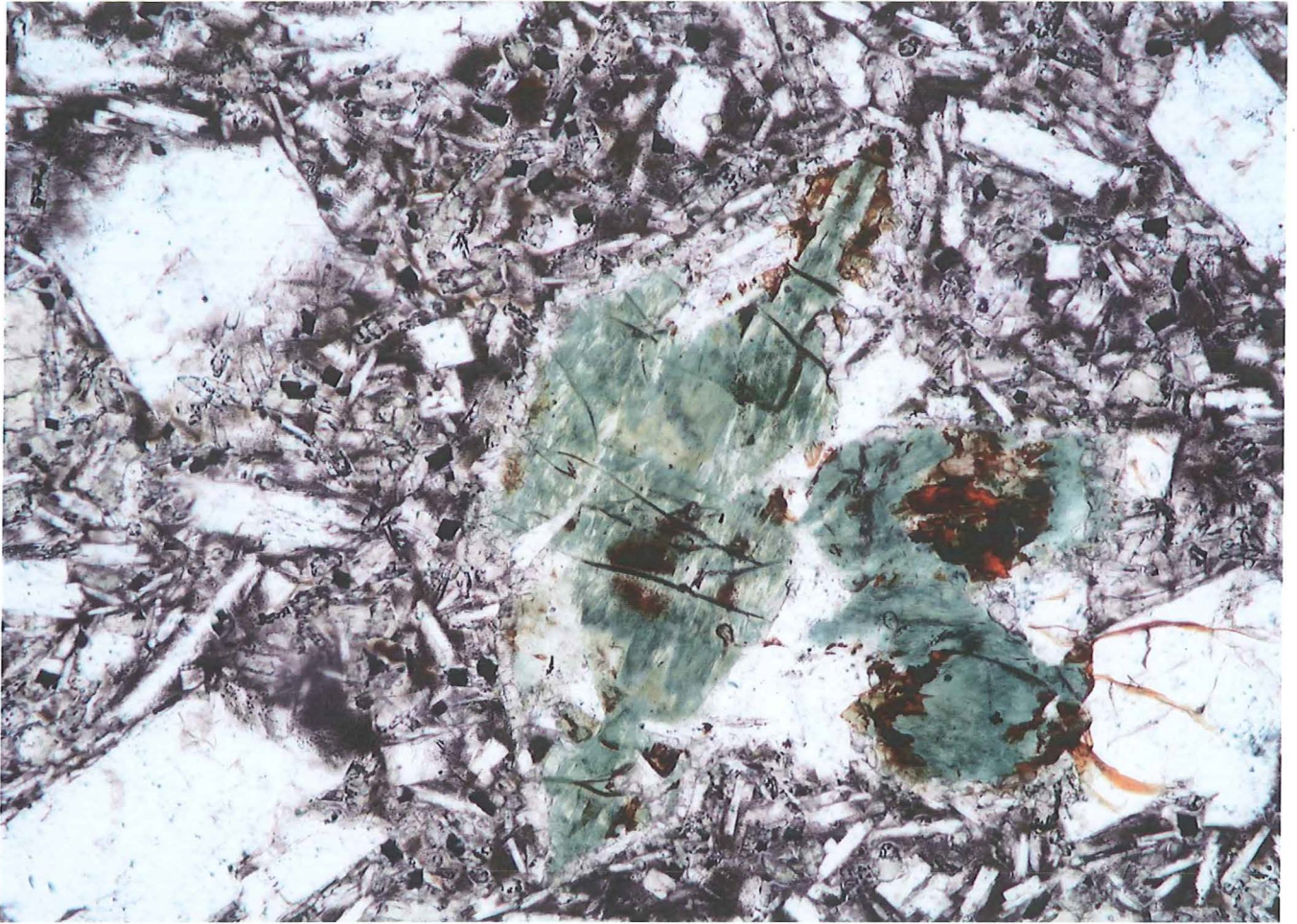
Plag

cpx - fresh

ol altered

cpx \gg ol

45-36-1100 olivine



45-34

1230

basaltic andesite

alteration

2-2

phenos

>50-60%

plag

cpx = opx

some partial
vermic filling
with clays

45-36

1410

Alteration

3

andesite

phenos 10%

plag

amygdules -

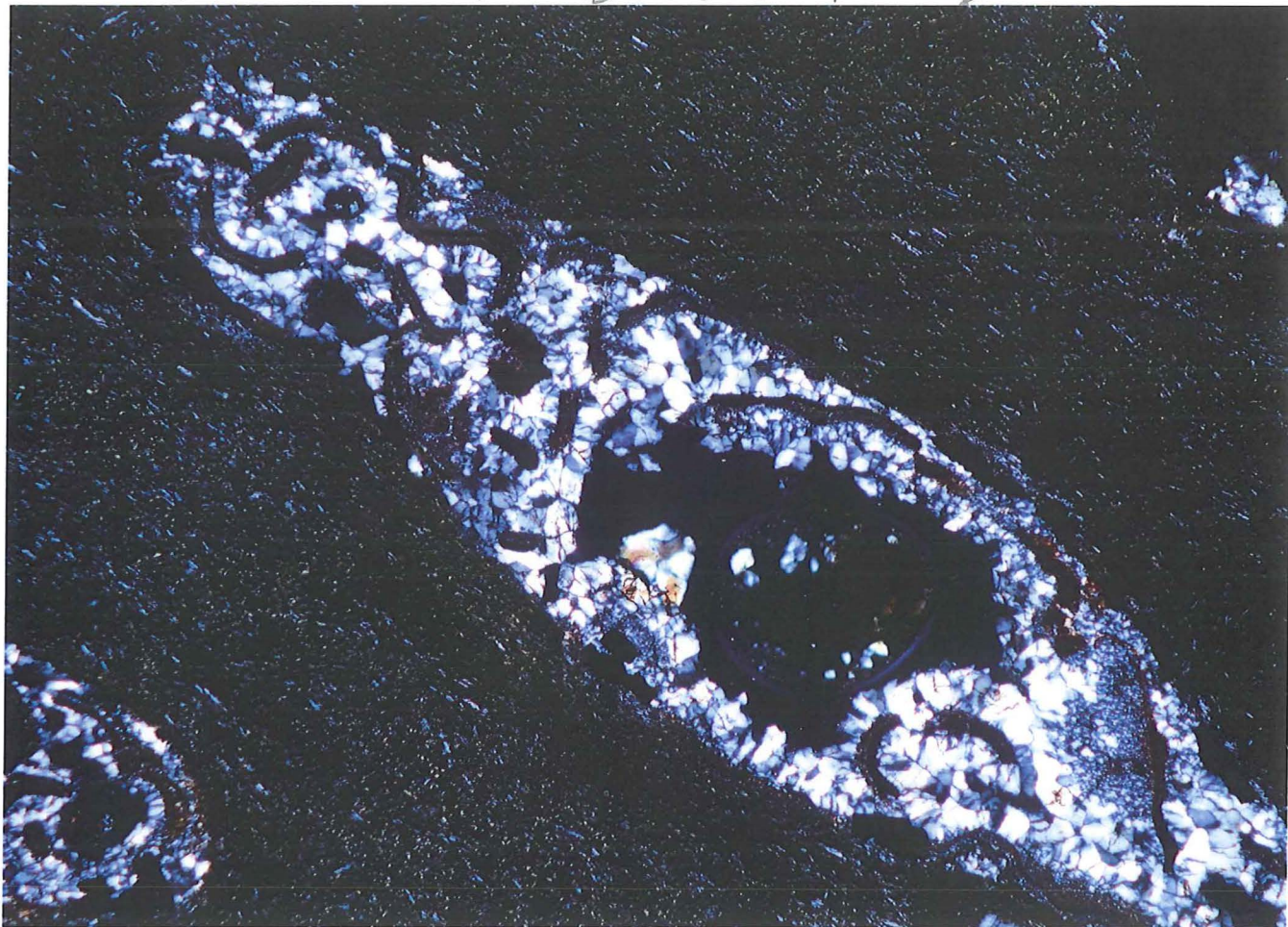
partially filled with

smectite[?] + zeol + FeO_x[?]

1410

x4

zeolite feline



45-36

1470

@ Keaton

chlorite in
groundmass

2

andesite
phenos 25%

plag

cpx - rare

ilmenite

GROUNDMASS

plag

cpx

45-36
1670

unwelded? tuffa.

abundant lithic fragments
in a zeolitized matrix

mostly andesite fragments

no obvious shards

alteration of glass \rightarrow zeolite

10

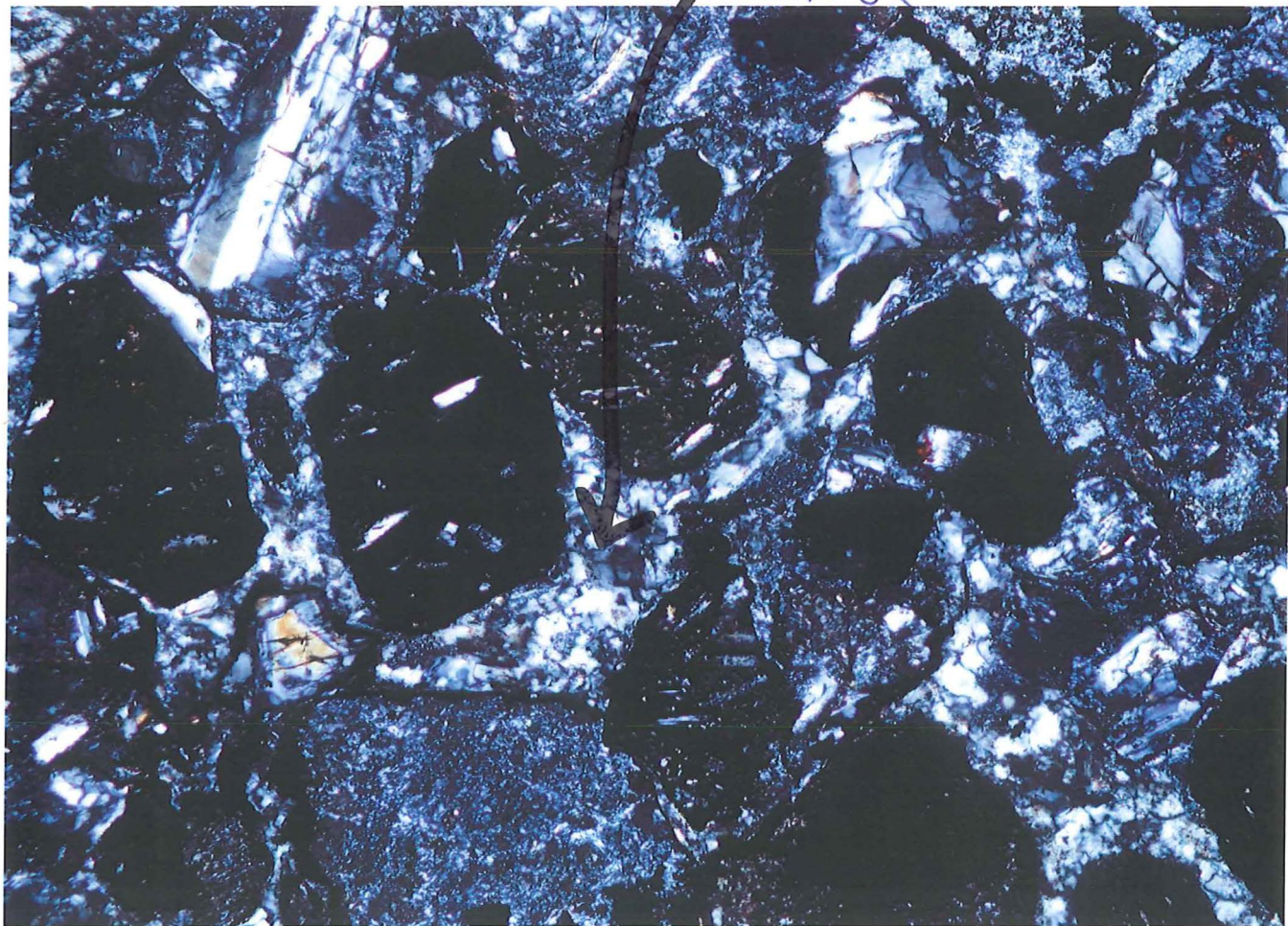
1670

x10

tuff



zeolite



45-36
1780

tu ff

zeolite
colcite

fragments of amygdaloidal
basalt

vesicles 100%

alteration

filled with zeolite
colcite

Strong

45-36

1860

barrois andente
andente?

pheno ~ 30%

ground.
microite plag + cpx

plag.
ilmenite
CPX

FeOx

alteration x 3 (glass → smectite)

-ve m of
qtz? + hematite

45-36

1940

ground.
plag
cpa
mag

attention
2 (glass →
smectite)

basaltic
Anders-

AA

less altered
3% phenos

plag

trace altered mafic-
01?

45-36

1990

alt-

1-2

minor smelt
after ground
glass

barrel

phenos 25

plag

olivine - 2 - highly
altered to
ch.

Y5-36
2060

alt.
2

hematite veins
dr microbreccia
Smechite after glass

Baraef

flow microbreccia
phenos 15%

plag

Cpx (21%) intergrown with pl

Ol: (1) highly altered

groundmass -

plag + cpx

45-36

2140

basalt

flow interior

at.

2 -

oliv no altered

smect. after ground

3 smect. strays

phen 30%

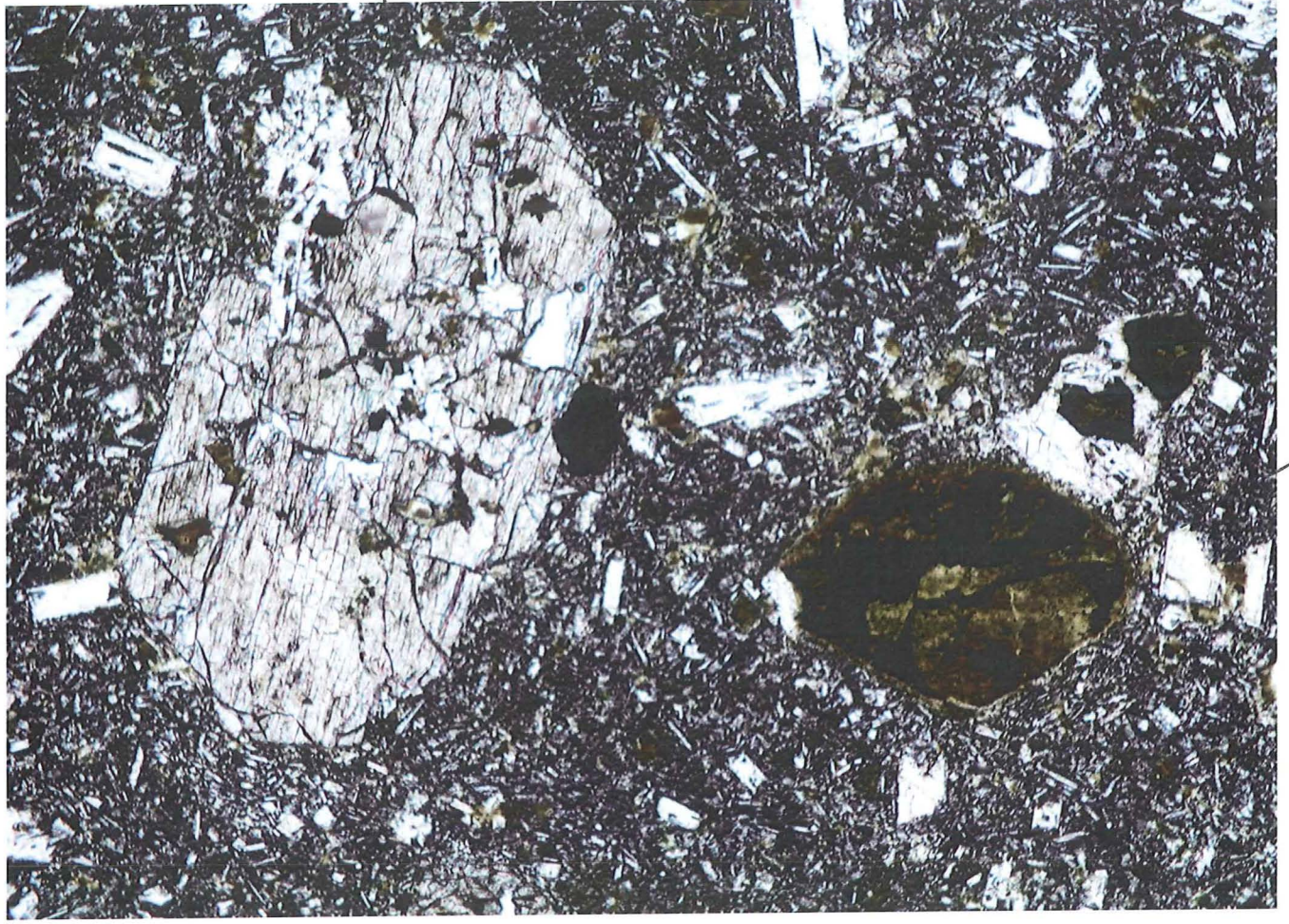
pl

ol - altered

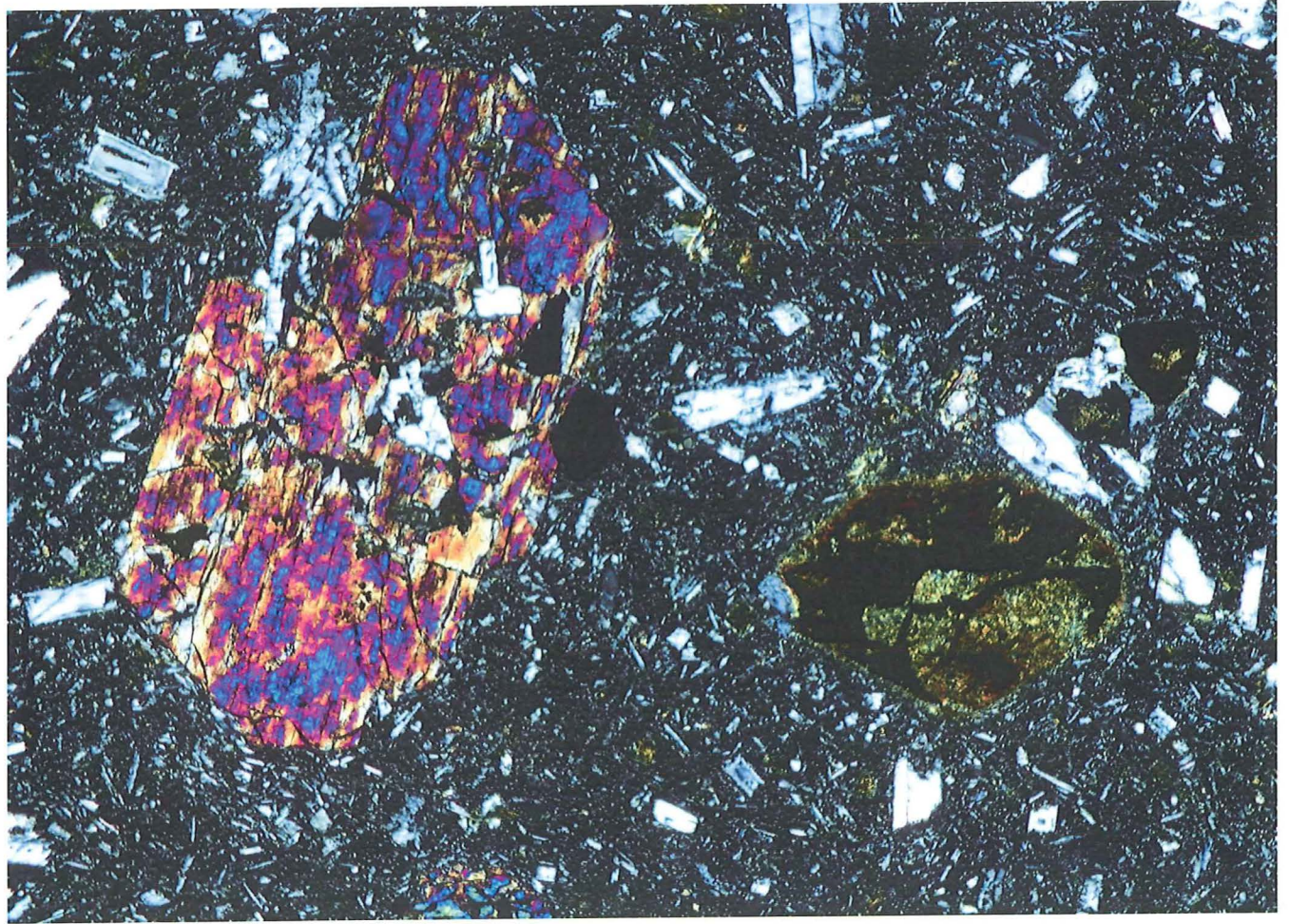
cpx

9847 2140 basalt

x4



01



00

Barat

alterat
3

pheno
20%

plaz
olive oil refer
cpr

SMPC vendors

2350

tuff-
fragmented rocks-

fragments rhyolite, basalt, andesite
↓
flow banded

caliche - hem
concrete

2390

very coarse ground

~~2~~

basalt flow interior

smectite vein

glau → smect

90% xtdls

plag

ol. vein

cpx in matrix

No wairakite in this section

45-36

2420

5

basalt
fine grained

abundant st + chl(H)
veinlets

L3

plag
pyx - altered

st

^{vugs}
qtz(chal?) → chl → qtz

veinlets contain brecciated fragments
no open space left

45-36

2530

andesite / basalt

alter

2

pheno -

< 5%

plag

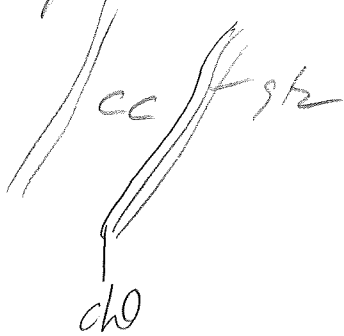
cpx (rare)

veins

multitype veins

qtz + bladed cc

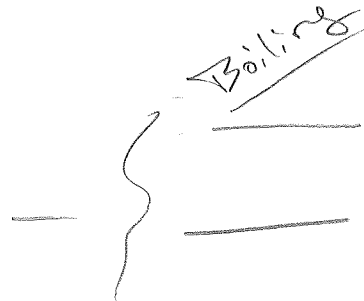
qtz $\xrightarrow{\text{chl}}$ cc



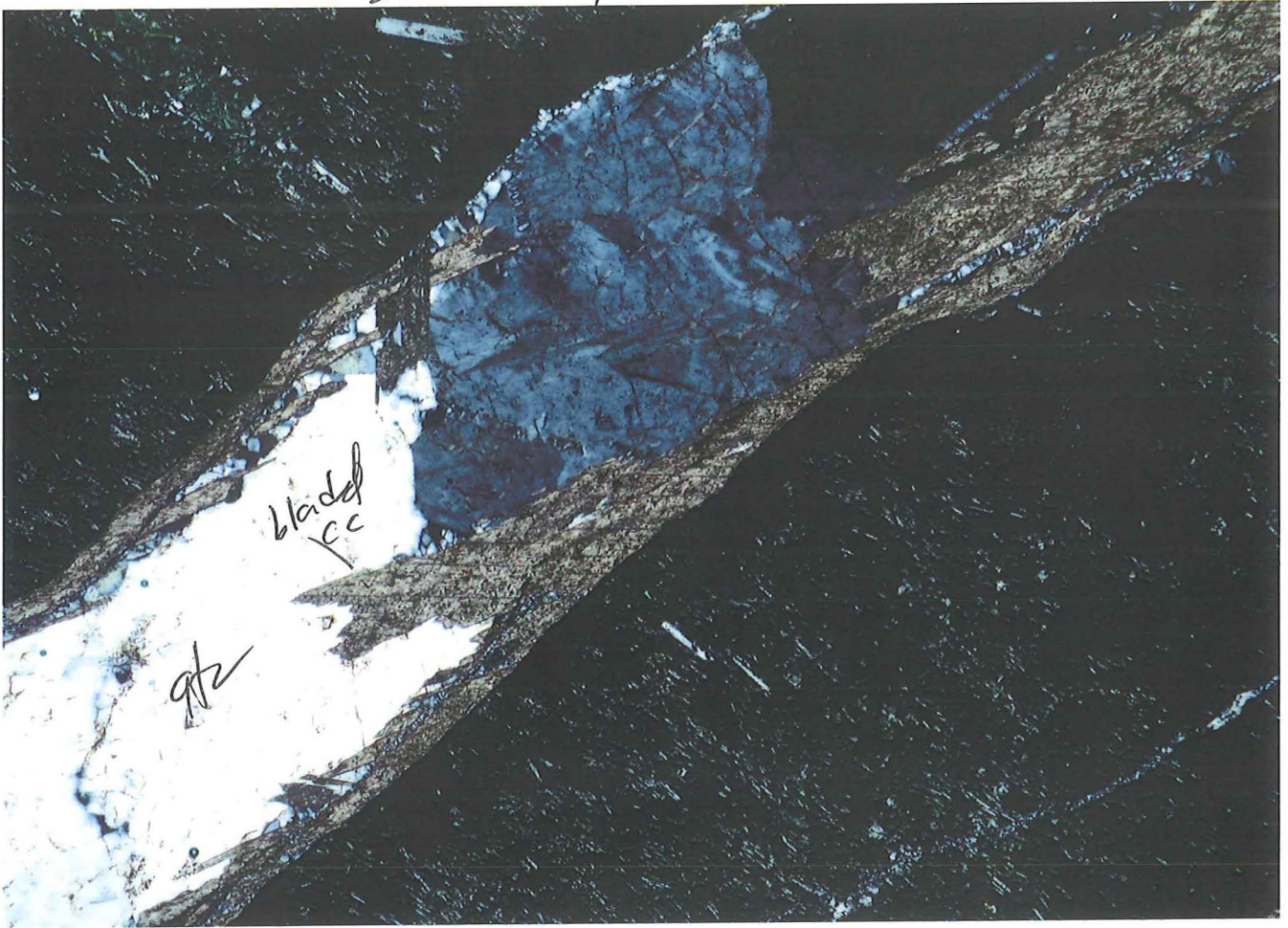
veins completely filled

qtz —

cal —



2530 x 4



2620

AlH-

—

q

Silicification

Devitrified

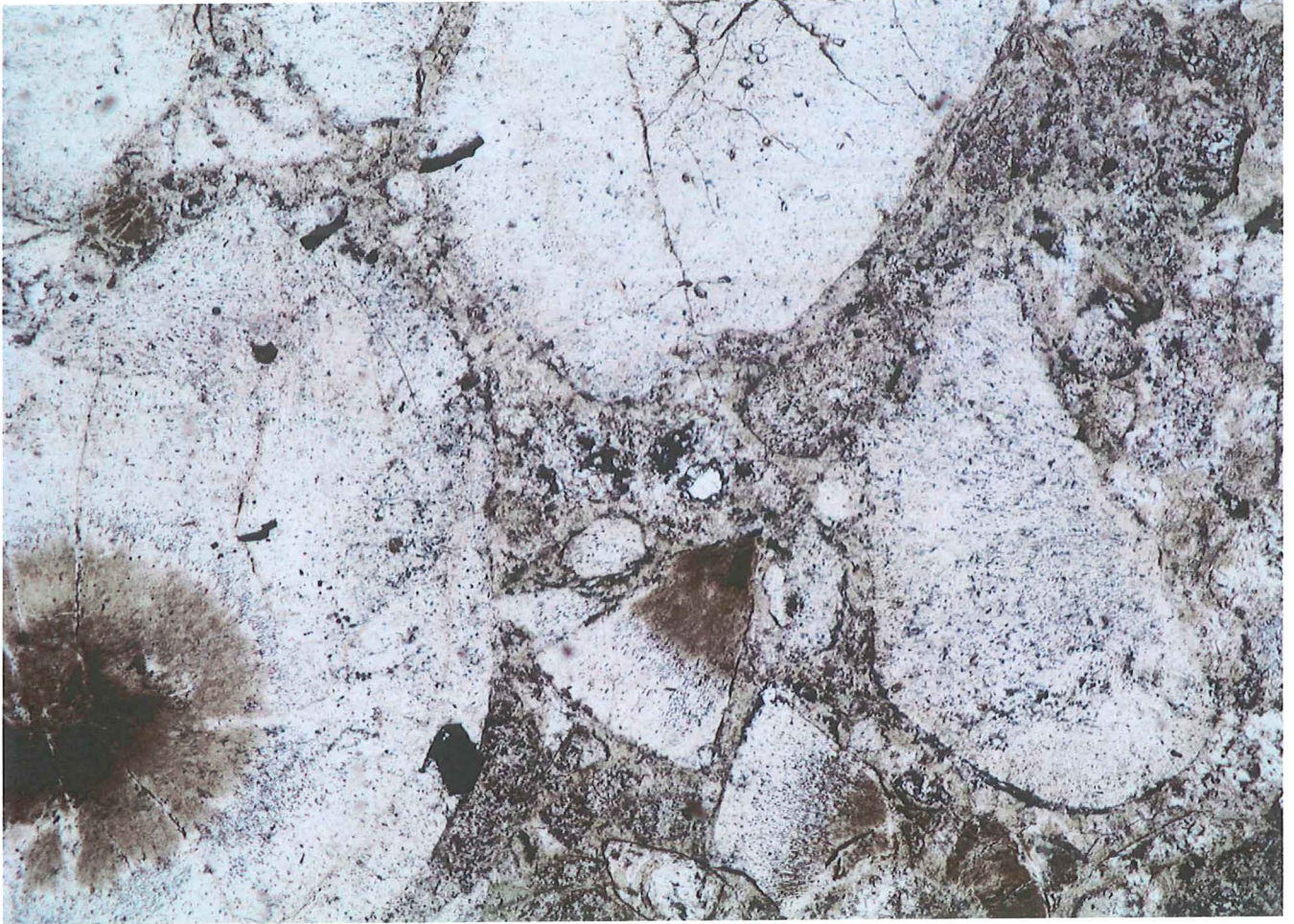
chydric -
entirely fragmental with a
jt matrix

no phenocrysts

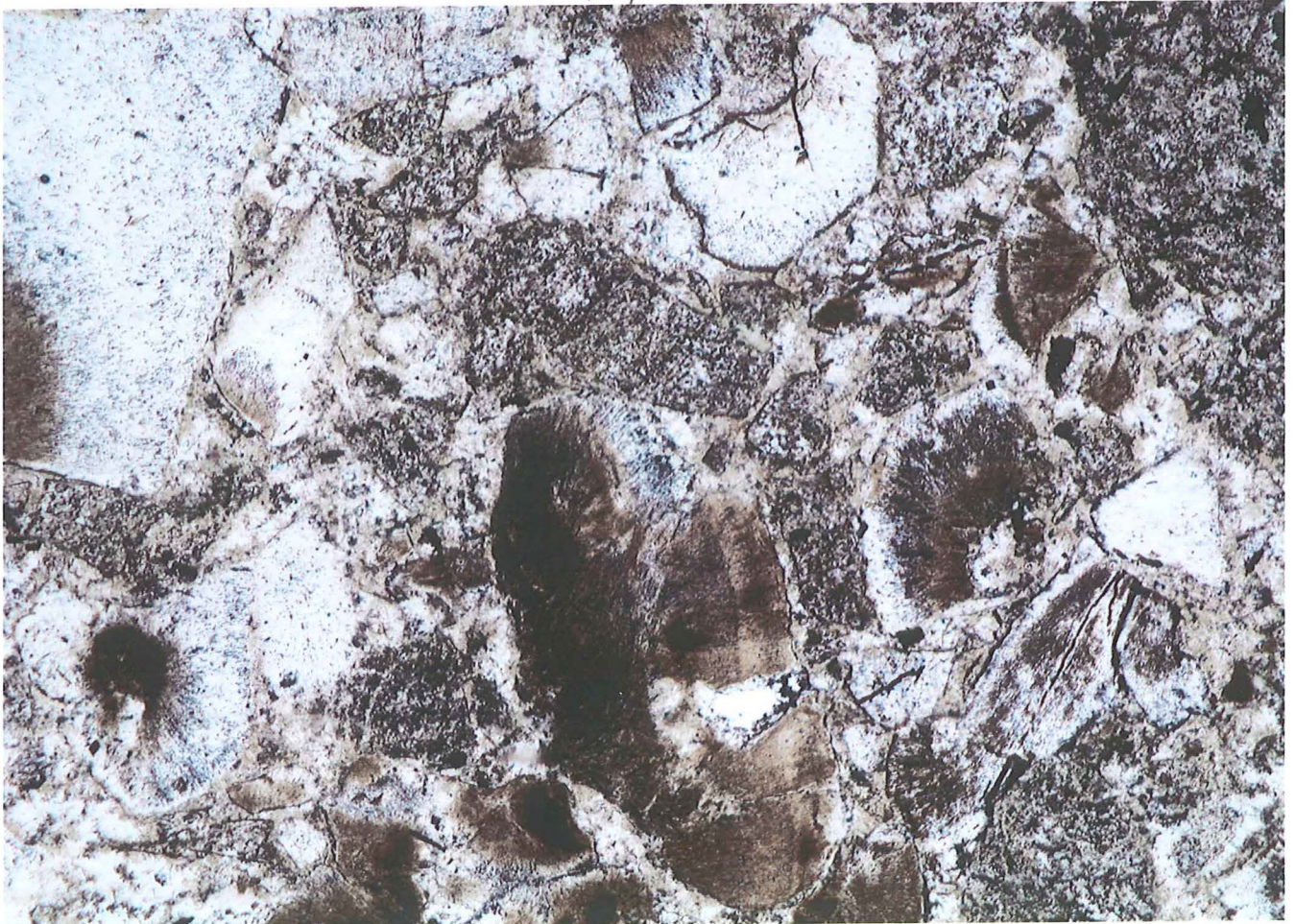
rocks consist of
fragments of spherulites in
a matrix of jt - too
c.g. to be devitrification

Hydrothermal breccia

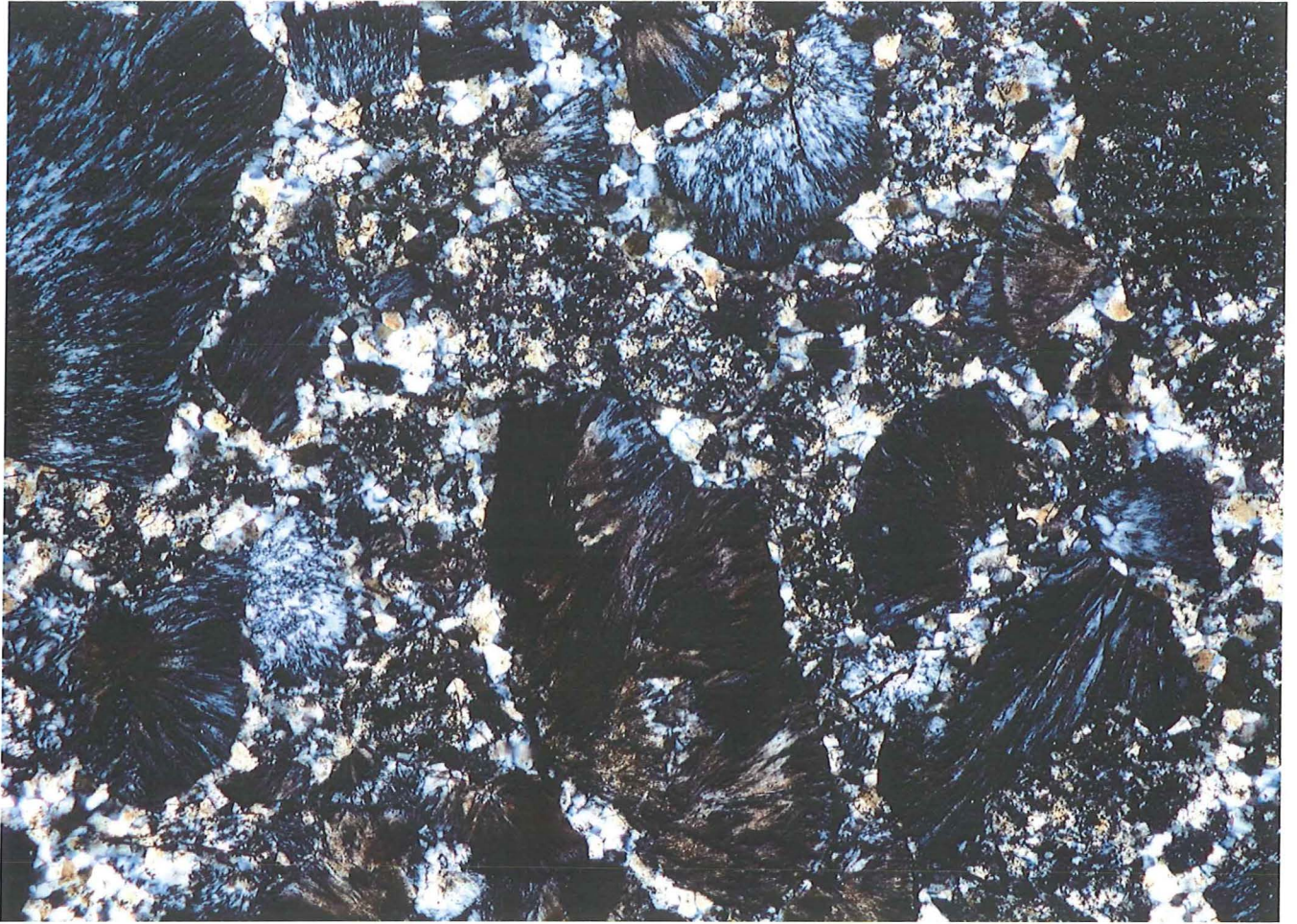
2620 x4 Hydrothermally brecciated rhyolite



x4



x4



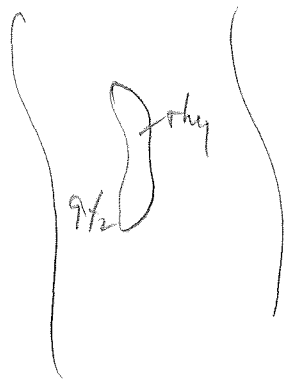
2750

Alt. 4

Rhyolite-
devitrified

some coarse grained gte that appears to
be secondary based on grain size -
too coarse for devitrification
contains fragments of rhyolite -

root of
hydrated
breccia



2780-

phyllite
deformed

no penetrant

traces of

traces of microbacteria

(hydrothermal)

(1) fine discontinuous
silica veins

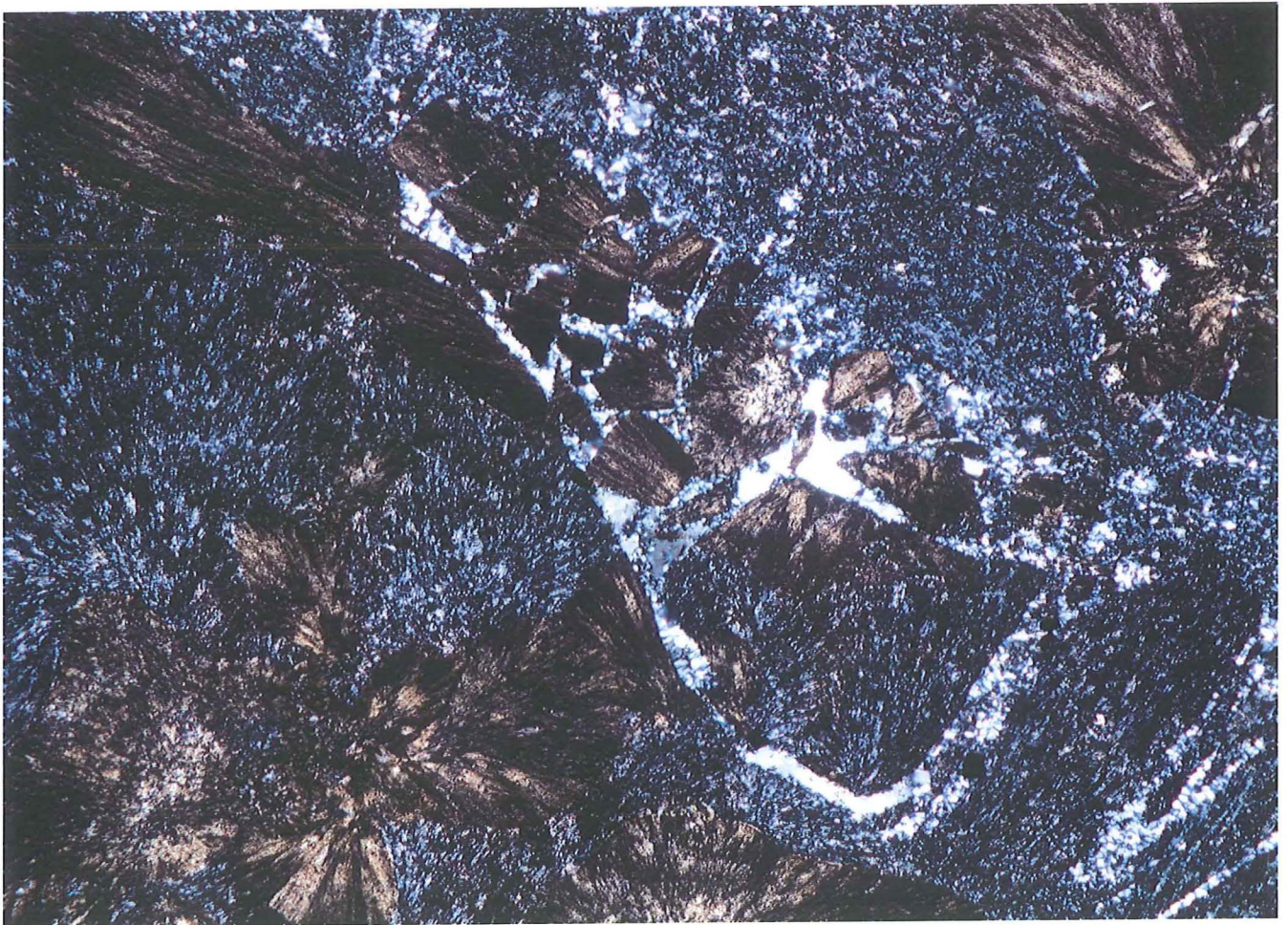
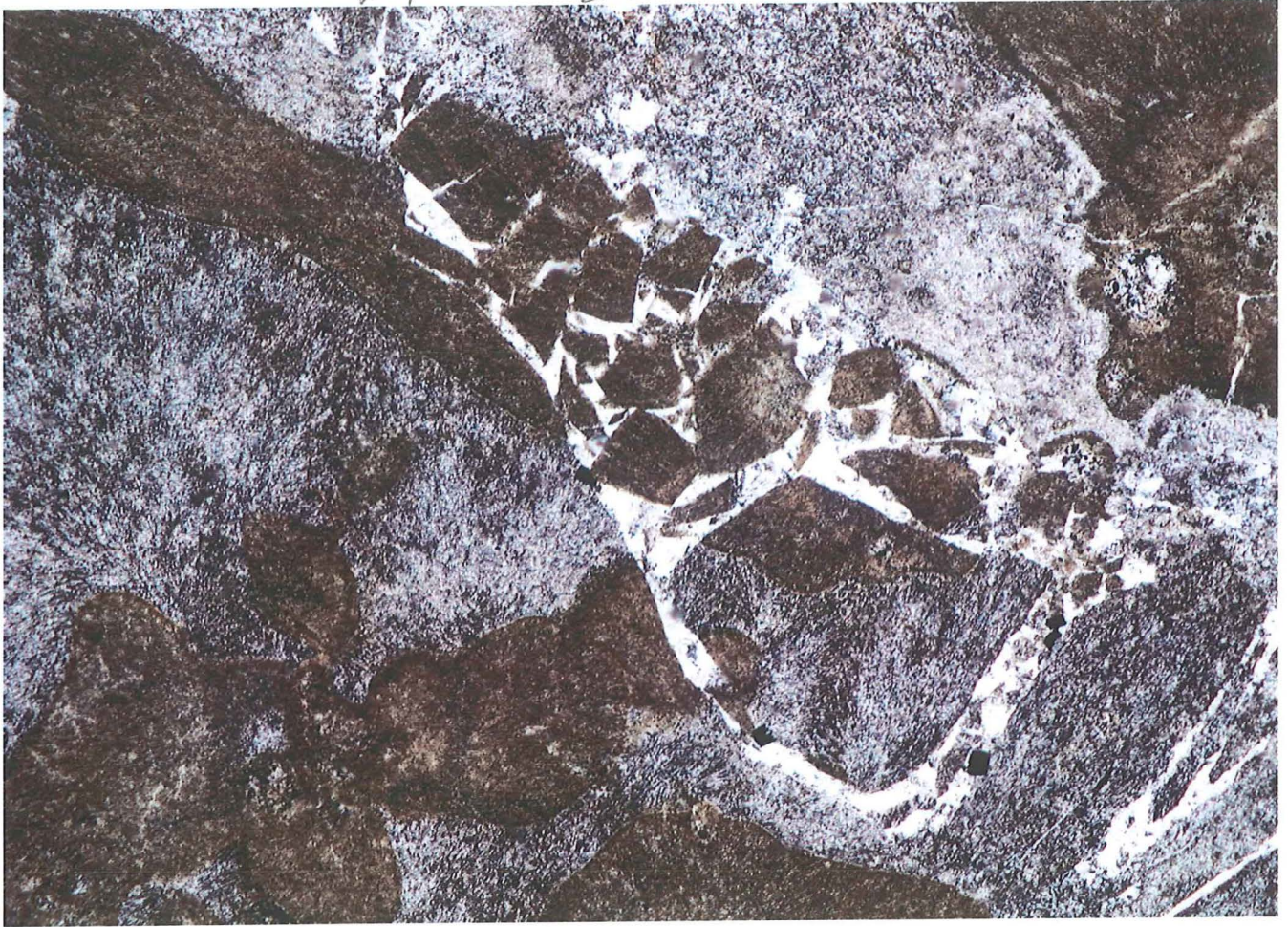
(2) fine-smectite/chlorite veins

roofs or side of
breccia

x4

2780

silicified, brocc. rhyolite



2880

rhyolite

Silicified

qtz veins

alt. 9

No porphyry

conditic s plays of mica

Amec

sericite

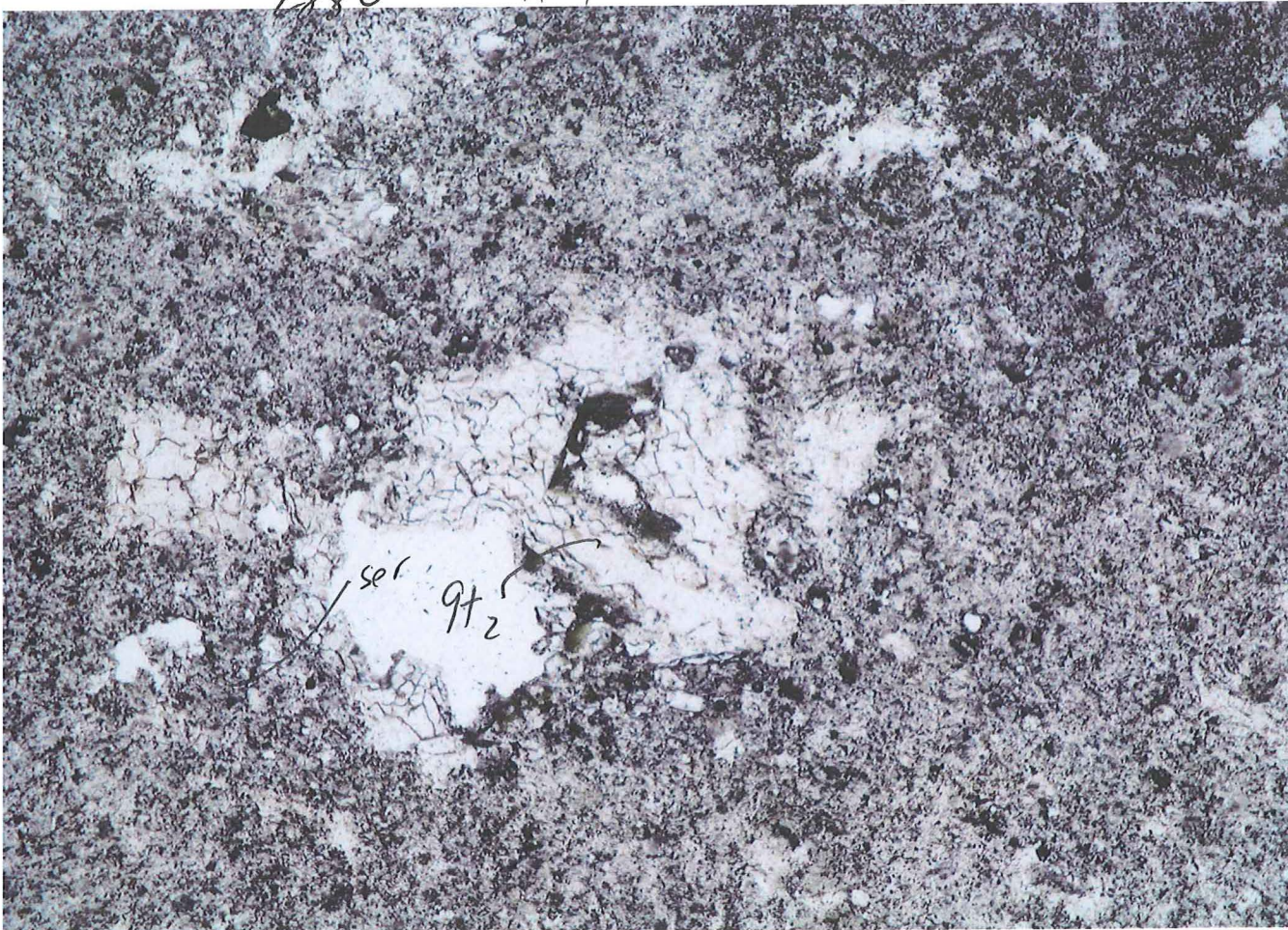
—

qtz

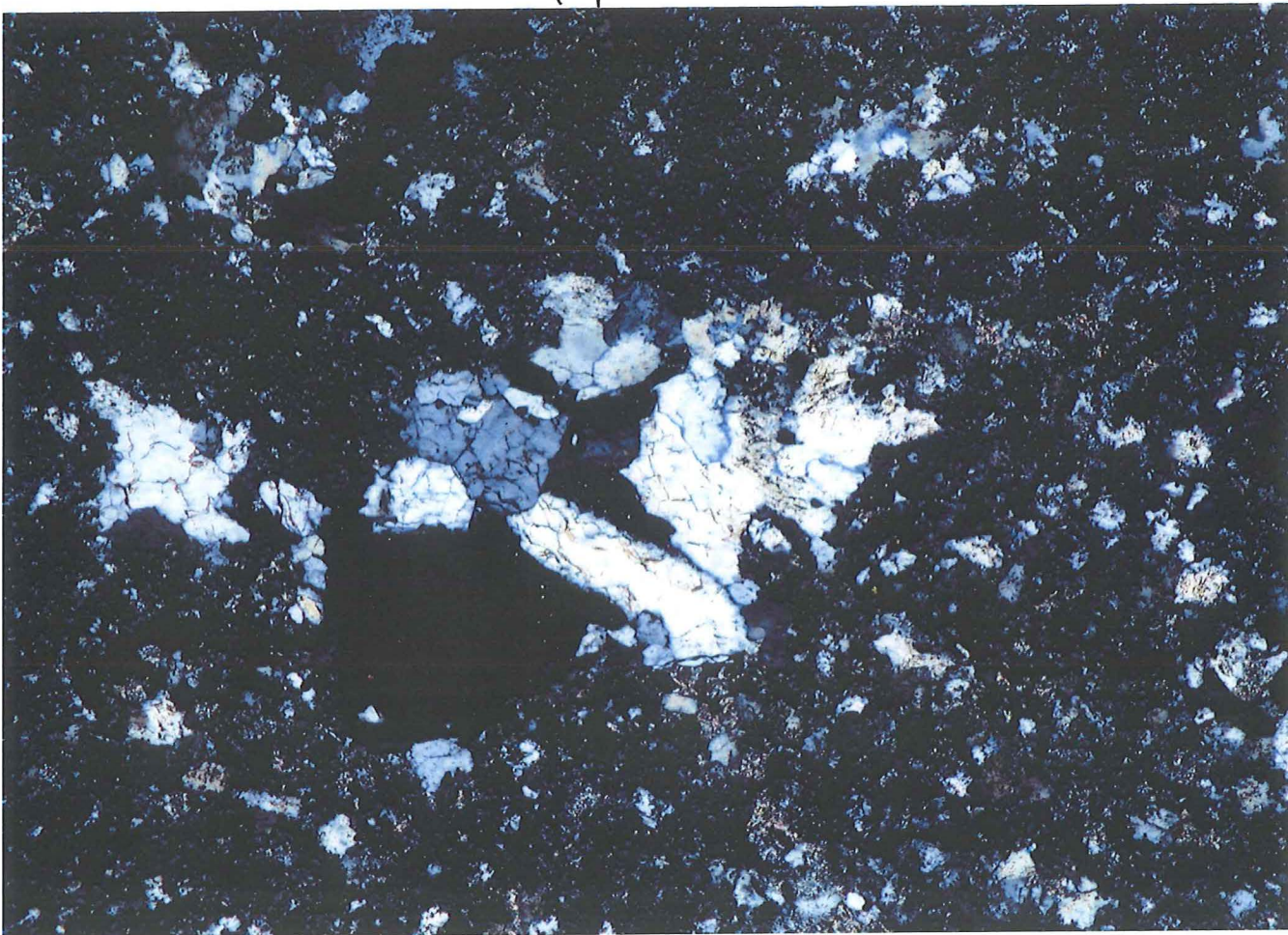
alt
cavities

2880

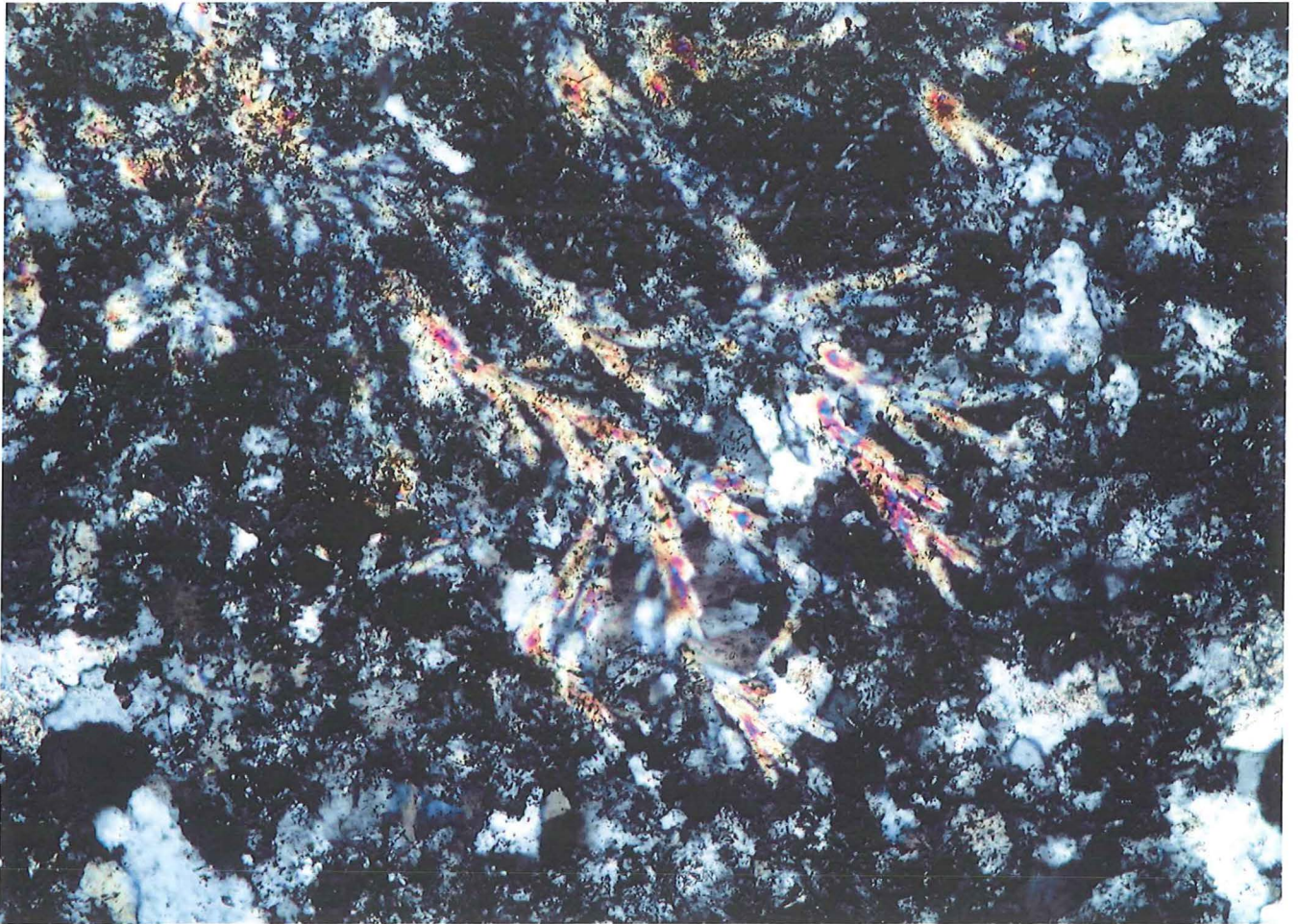
x 4



x 4



x4



sericite dendrites

3000

abundant c.s.
silicified - Thyplo

8

well developed
flow banding
No phen.

silica veins

traces of pyrite + magnetite

3100

Glyblite

micro

brocciatel

Silicified

mod. alteration

1 to ~~3~~ 7

3220

lith tuff (rhyolite)

attention
of matrix
of
silicified

Poorly welded
silicified

rare cavities lined
with Qtz

contains fragments of

andesite, rhyolite, granite
(megacrystic intergrowths)
feld. & calcite

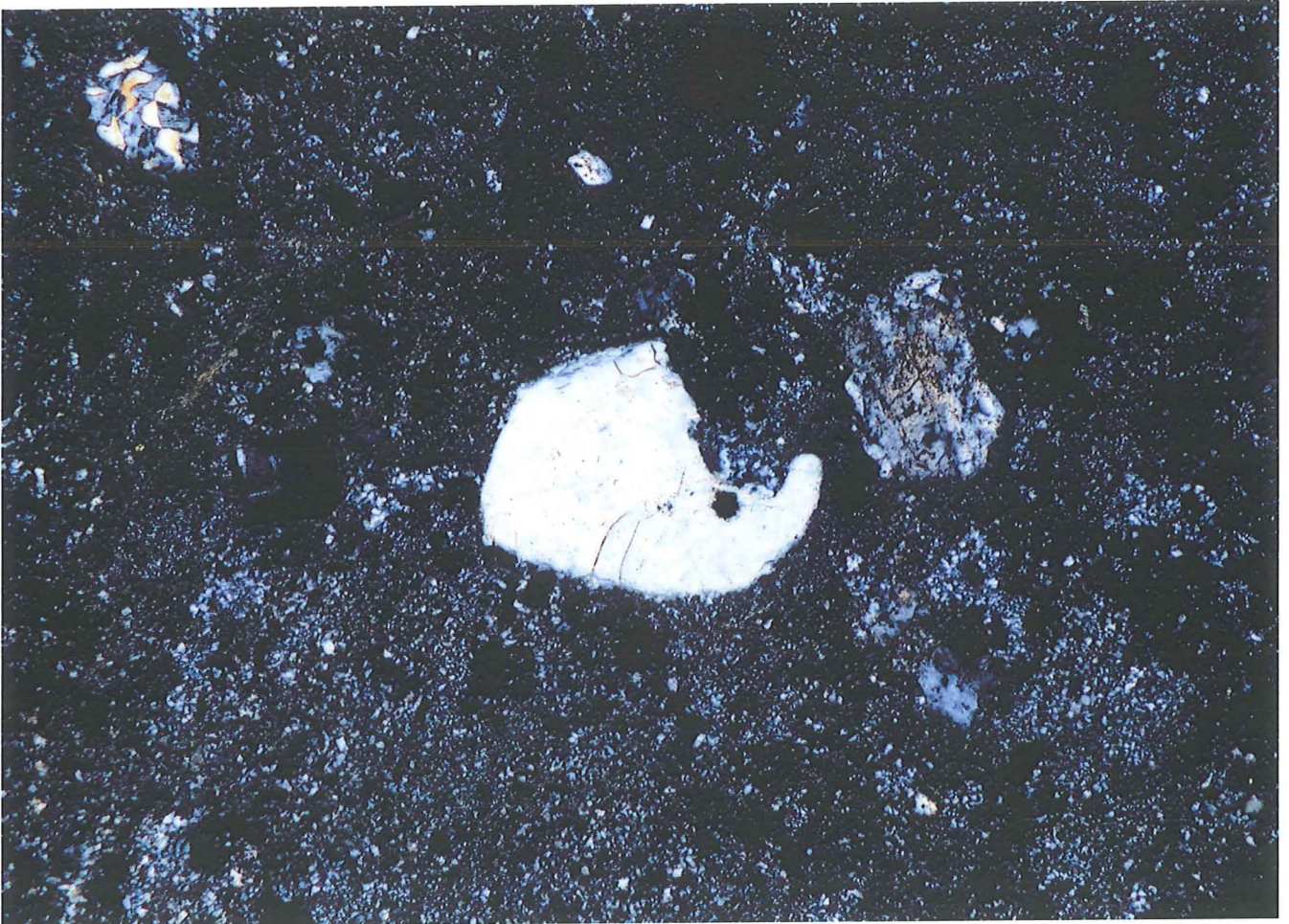
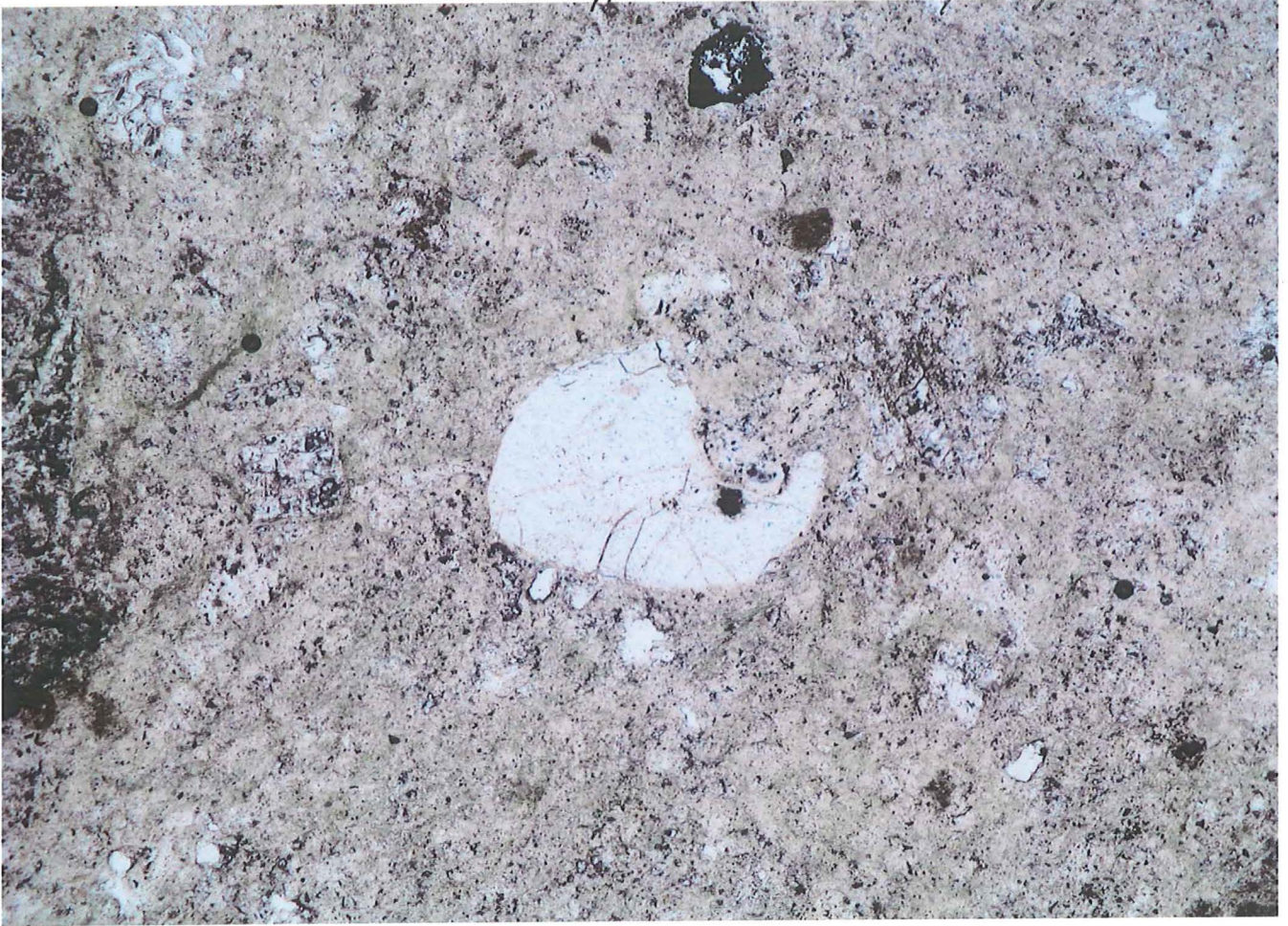
phenos - ⁵⁻¹⁰ 23%

Qtz, altered bio??

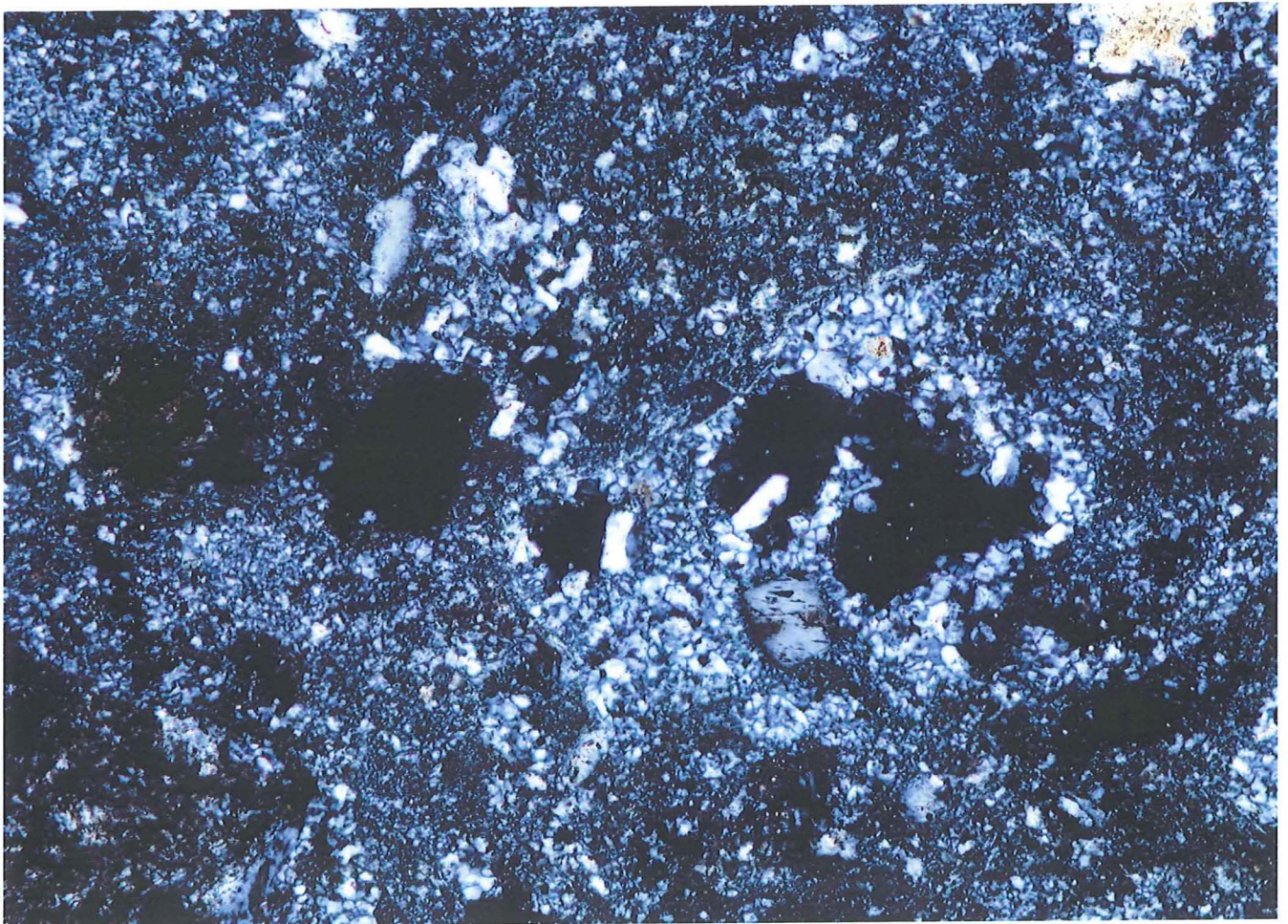
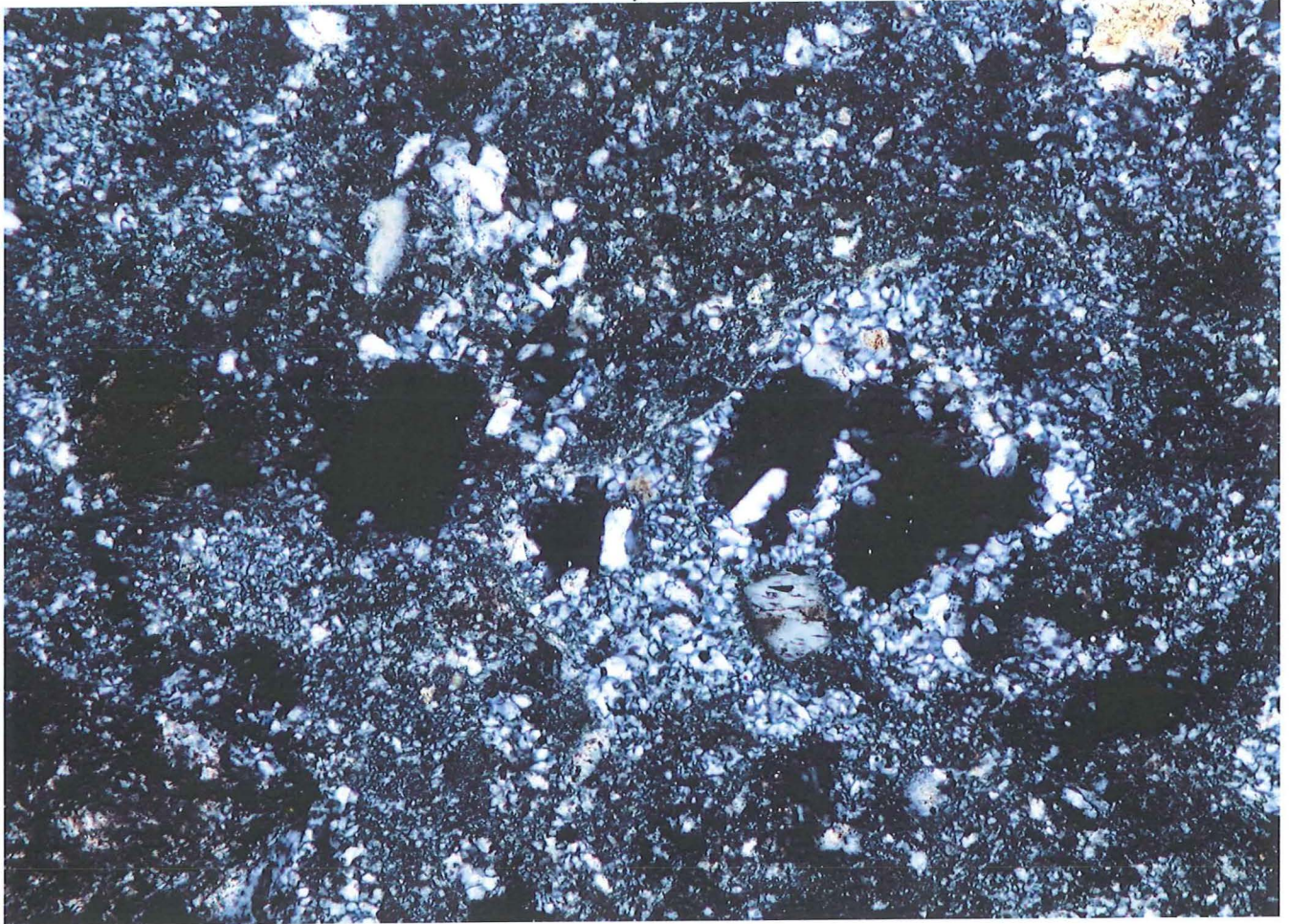
Keldipa - (sambic??) +
plag

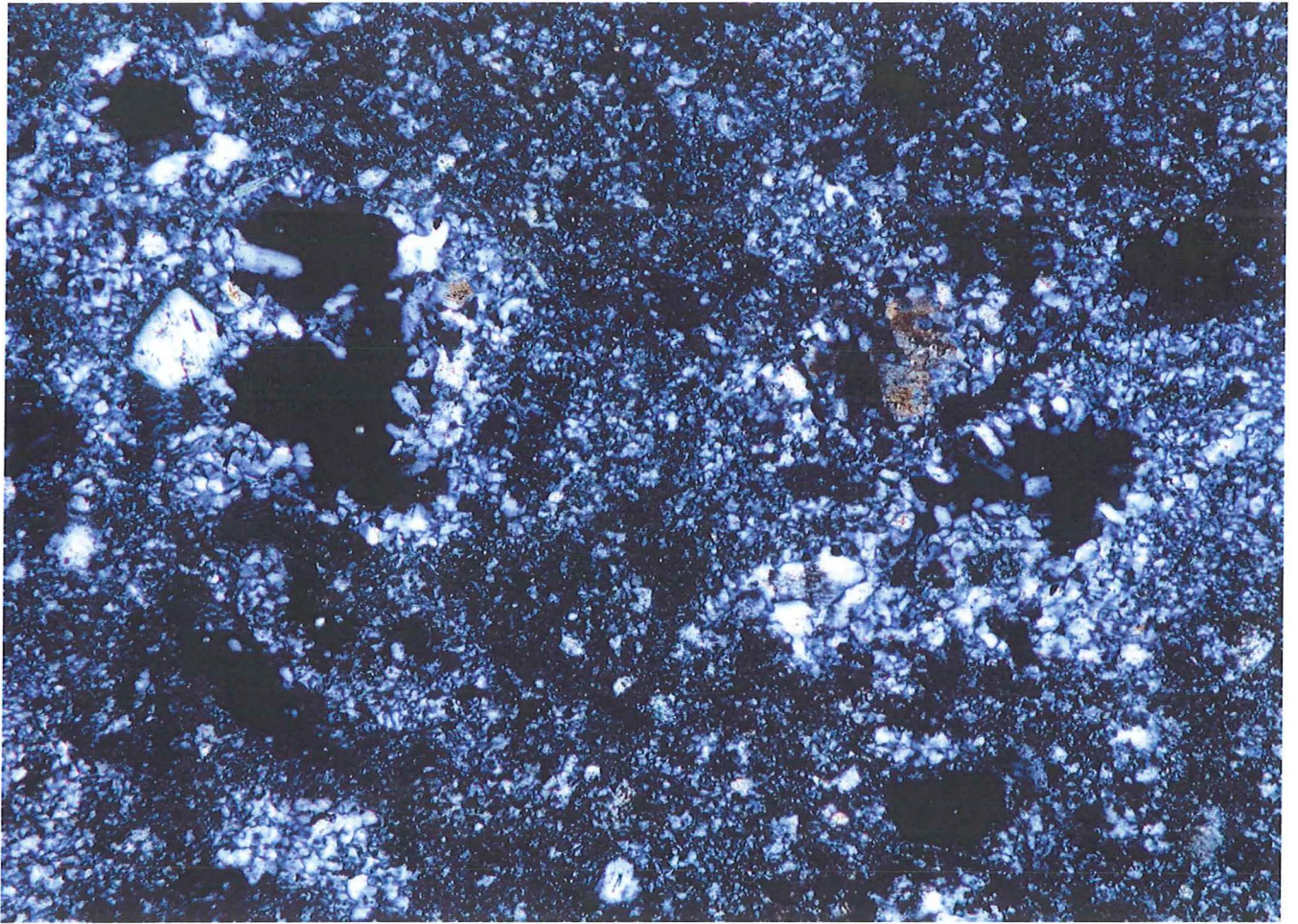
resorbed Qtz

x40 resorbed stz photo



x10 secondary gtz + sea





3320

alt $\frac{2}{3}$
calate
vsg filling

andrite?
druite

plag - micro lts +
mostly plucal

←
alterto Calate
+
sericite

plag

Also seems to
be quite a bit of Qtz?
in vsgs

3380

tuff
poorly welded

Attention-
of matrix
↓

frag.

ophyolite

hydrothermally silicified
ophyolite

to zeol??

pleno 25%
plag

3720

veinlets

cc

qtz

matrix-
alteration

epidote

qtz

chl

sphene

flow

pheno ~ 20

plag

mafic (traces) →

chl (could be
opx or horn)

Fragment of a
cumulate with

plag, interstitial qtz

epidote, sphene, chl

cc

3430

acute

flow

VOINS

phenos. + microphen
30

dr ep mi ven's

plug

epx → cc

gr —

cc —

ch —

ep —

dr

3520

Weak
No alteration

① 1-2

Traces of chl

smectite
vermic

Ardenb
flow

plg

cpX

OPX

actinolite after pyx

probably "denkic"

45-36

3720

silicified dacite

cut by
cc veins
qtz "

groundmass
altered (S)

to
epidote
chlorite
calcite
qtz

phenos

plag - 20% pheno

quartzite fr

Pyx ~~Albite~~? altered to
chlorite

veins

qtz

—

cal

—

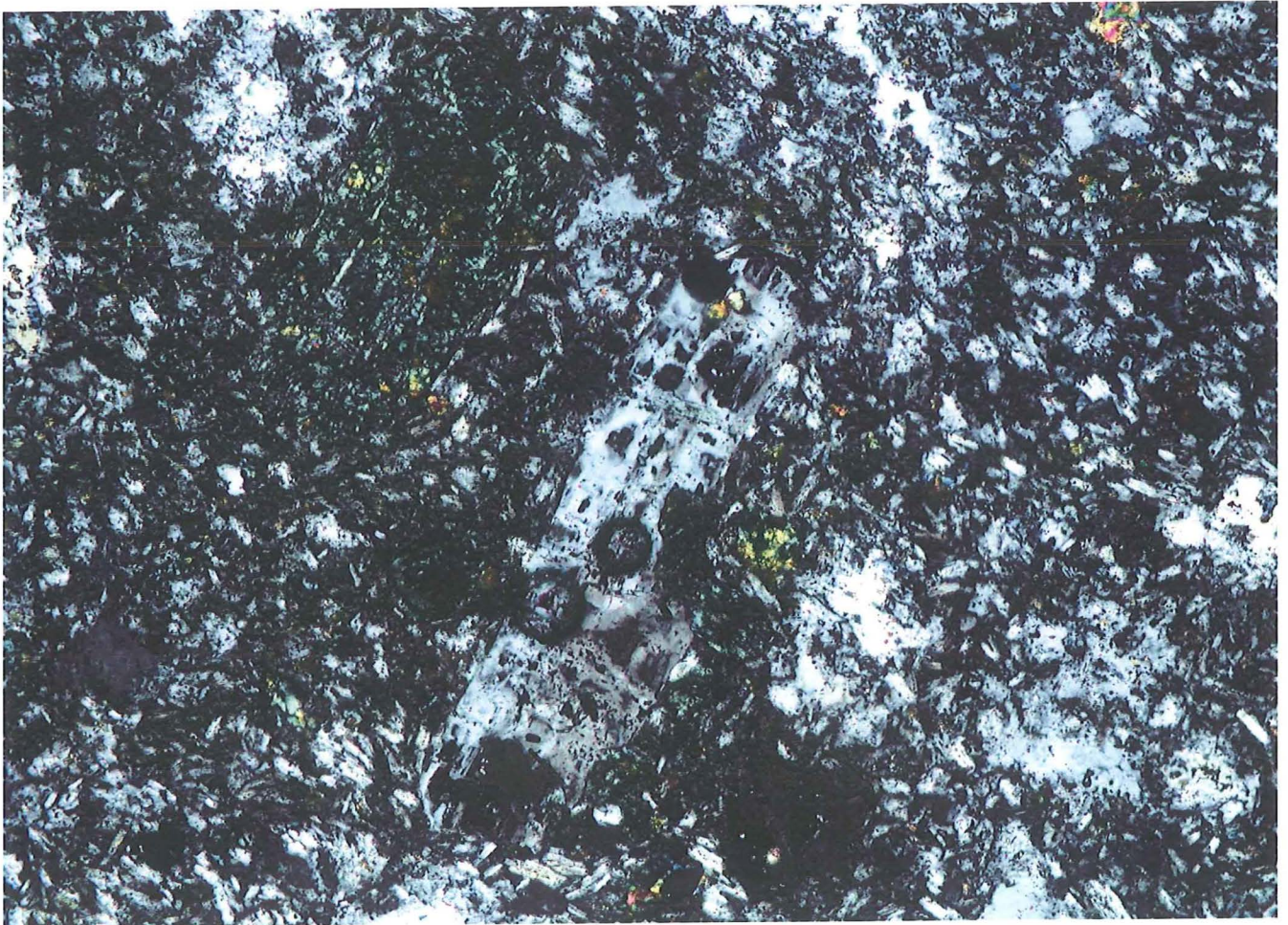
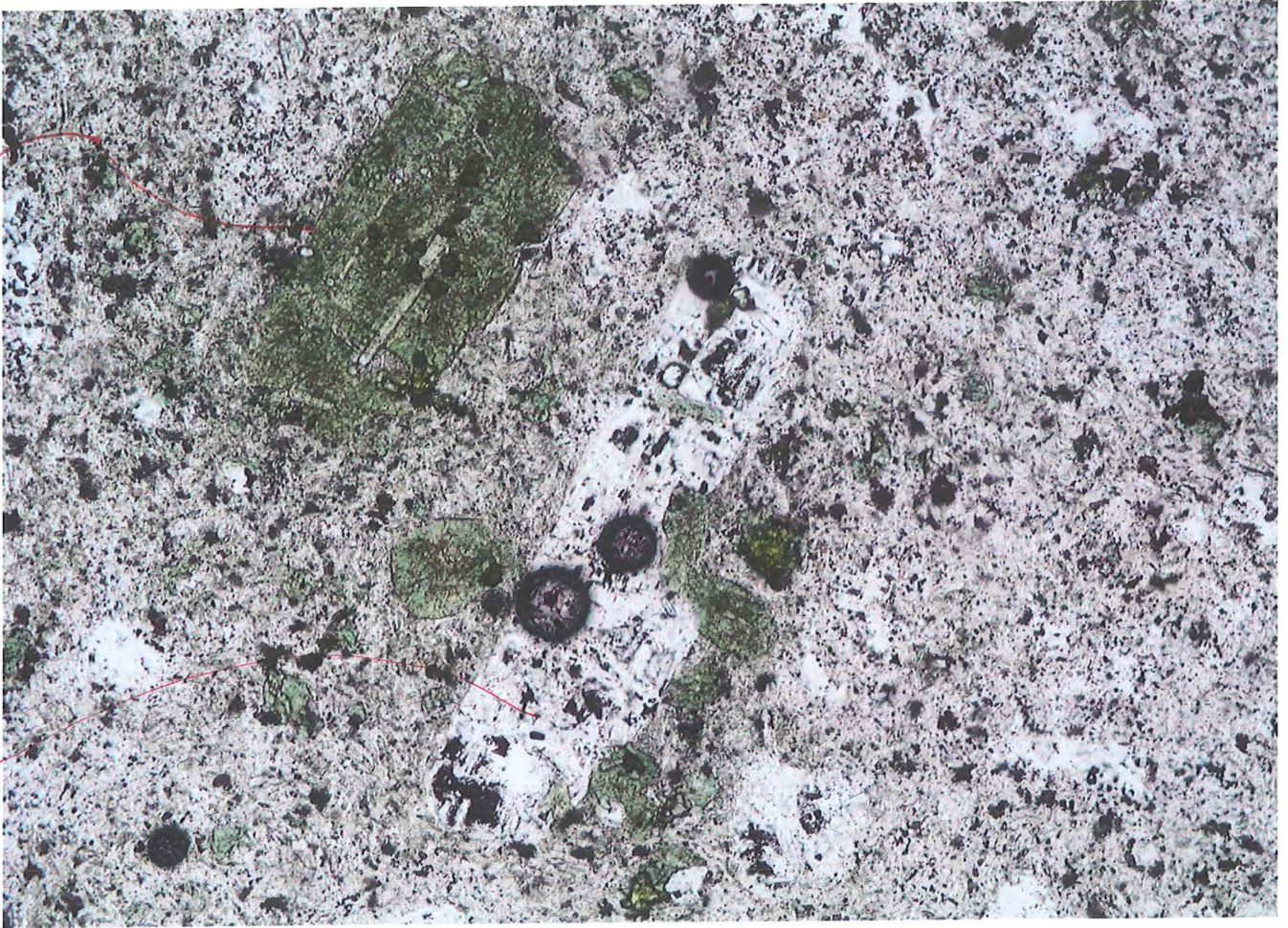
45-36

3720

x10

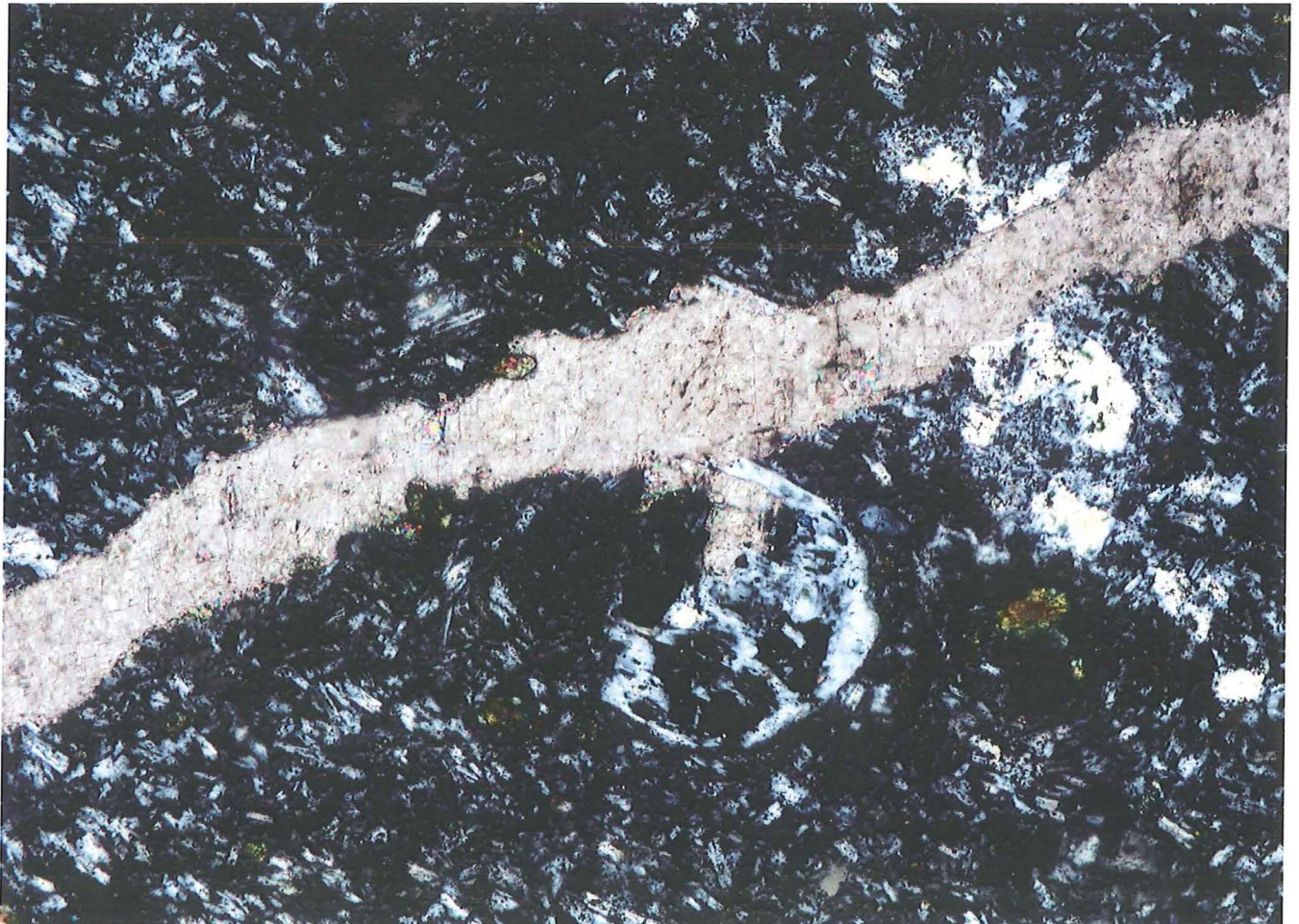
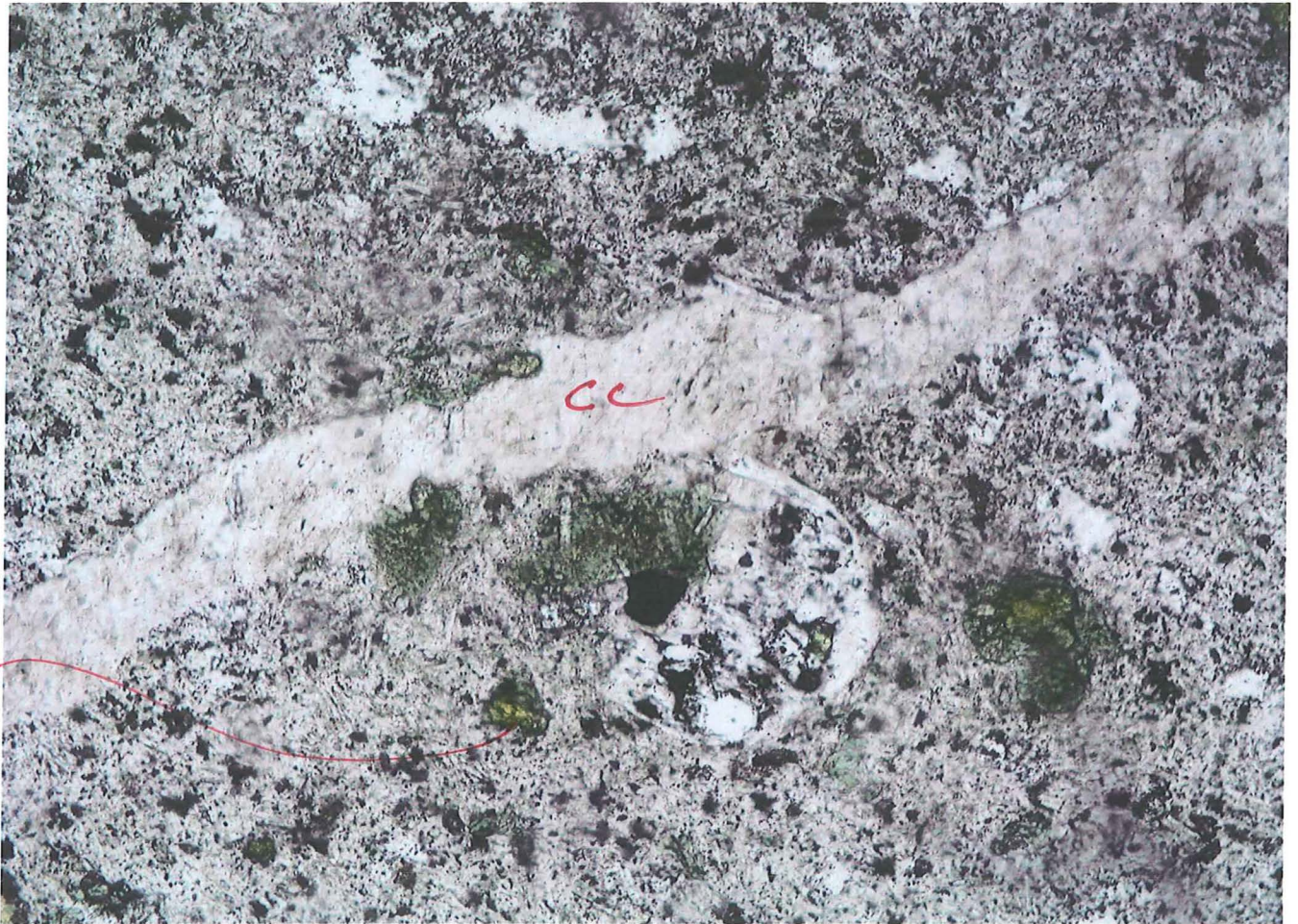
px
che

pag



45-36

3720 x10



45-36

DIABASE DIKE
3810 - 15 This a dike

Chlorite veins (1)

Andesite or basalt
unusual rock

groundmass alteration
(3)

large phenocrysts of
altered olivine??

in a groundmass of
plag + cpx

fine grained
~~ep + sphere~~
↑
~~ep??~~?

No epidote



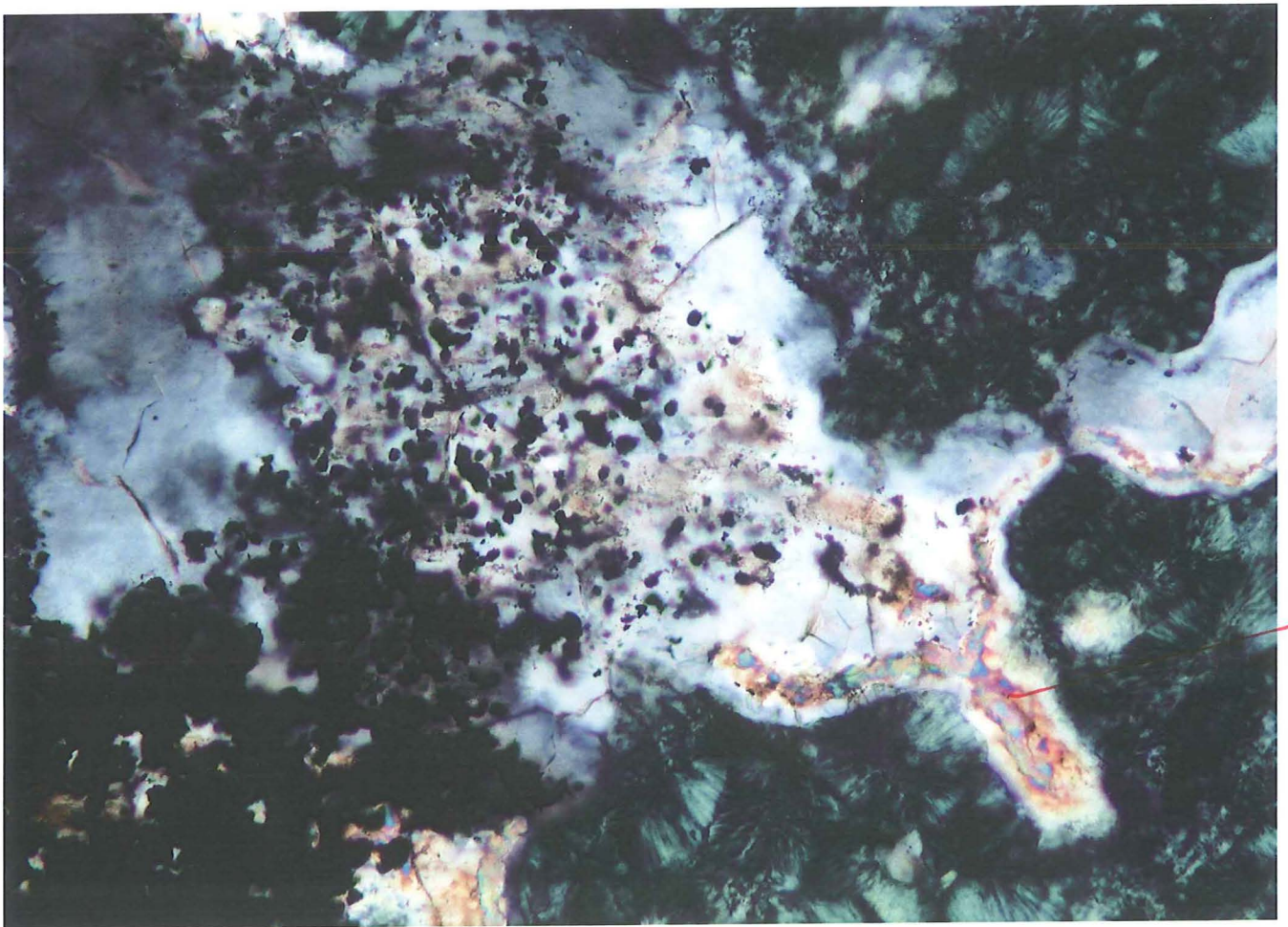
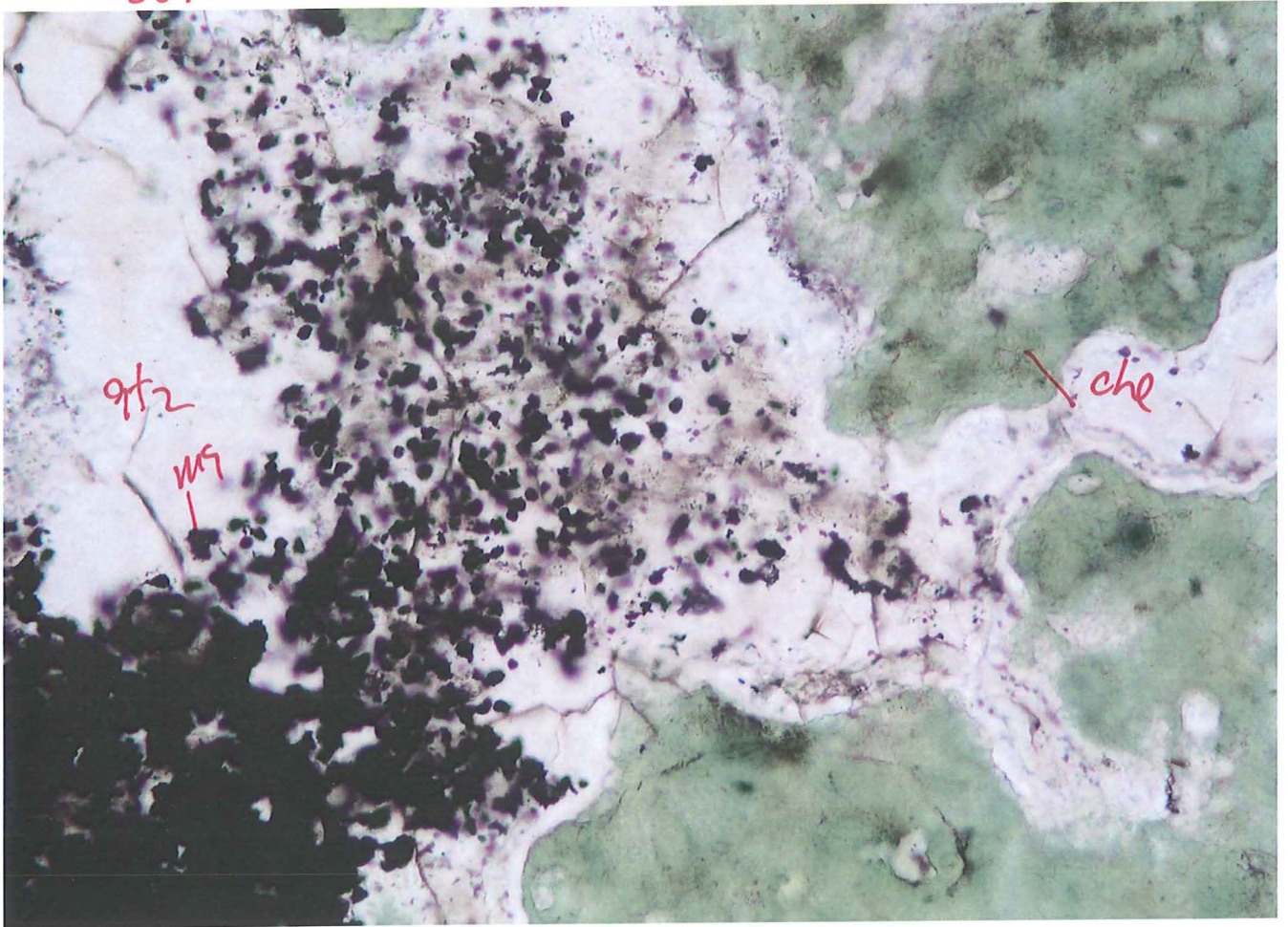
olive

chl + chal + mas + preh?

~~NO EPIDOTE~~

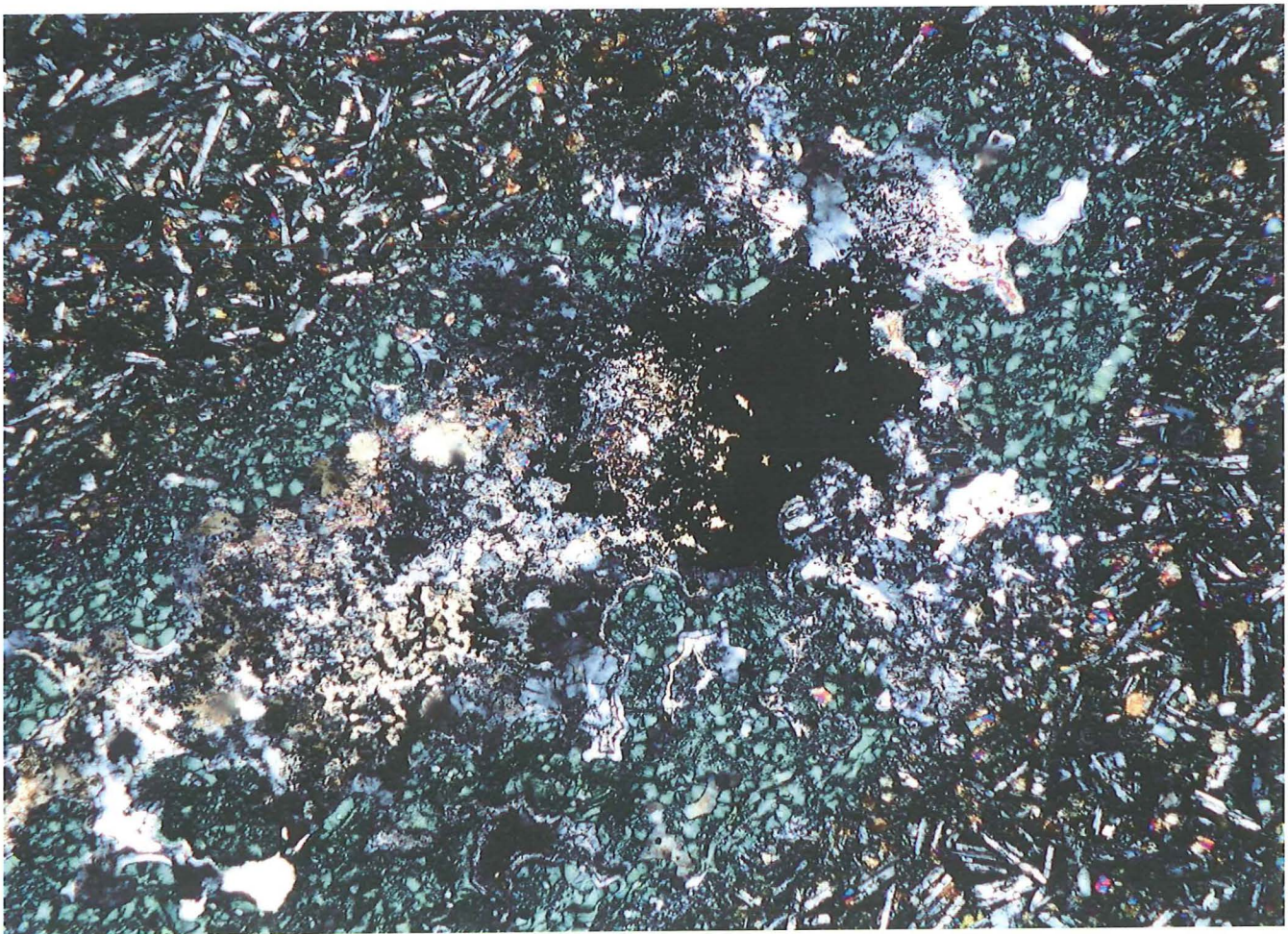
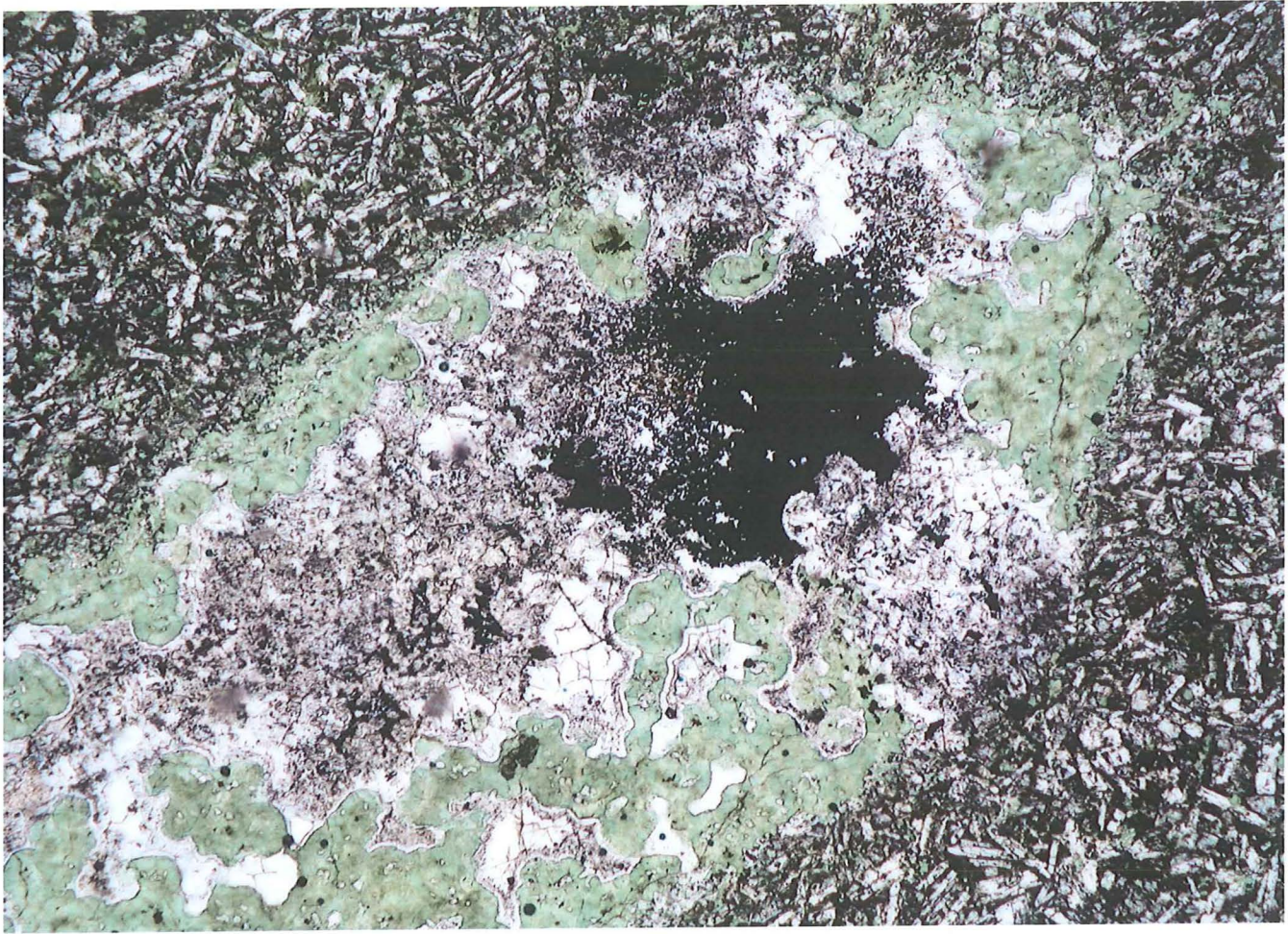
3810

X20

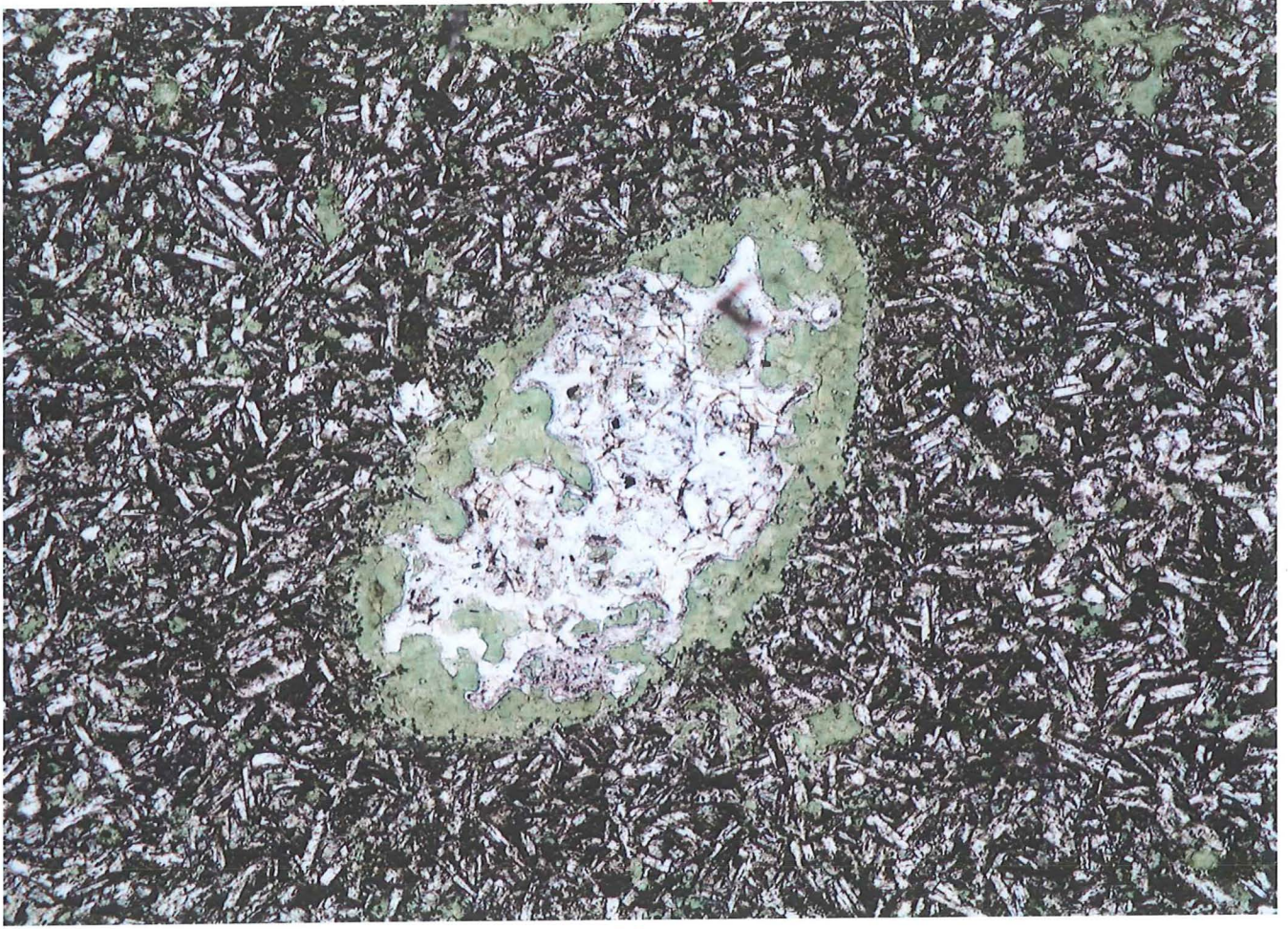


x 4 no above overview of stal

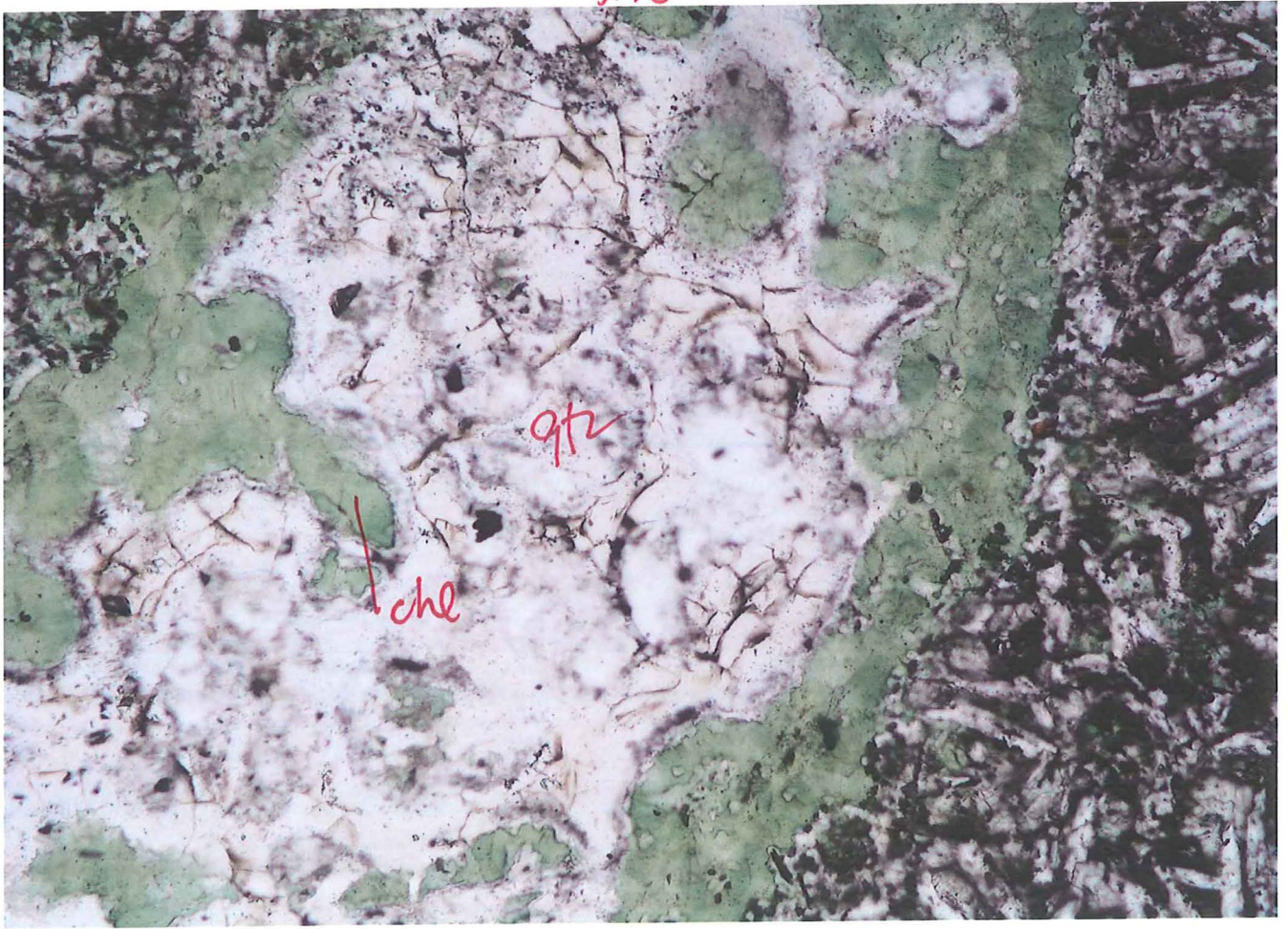
alkal
olime?



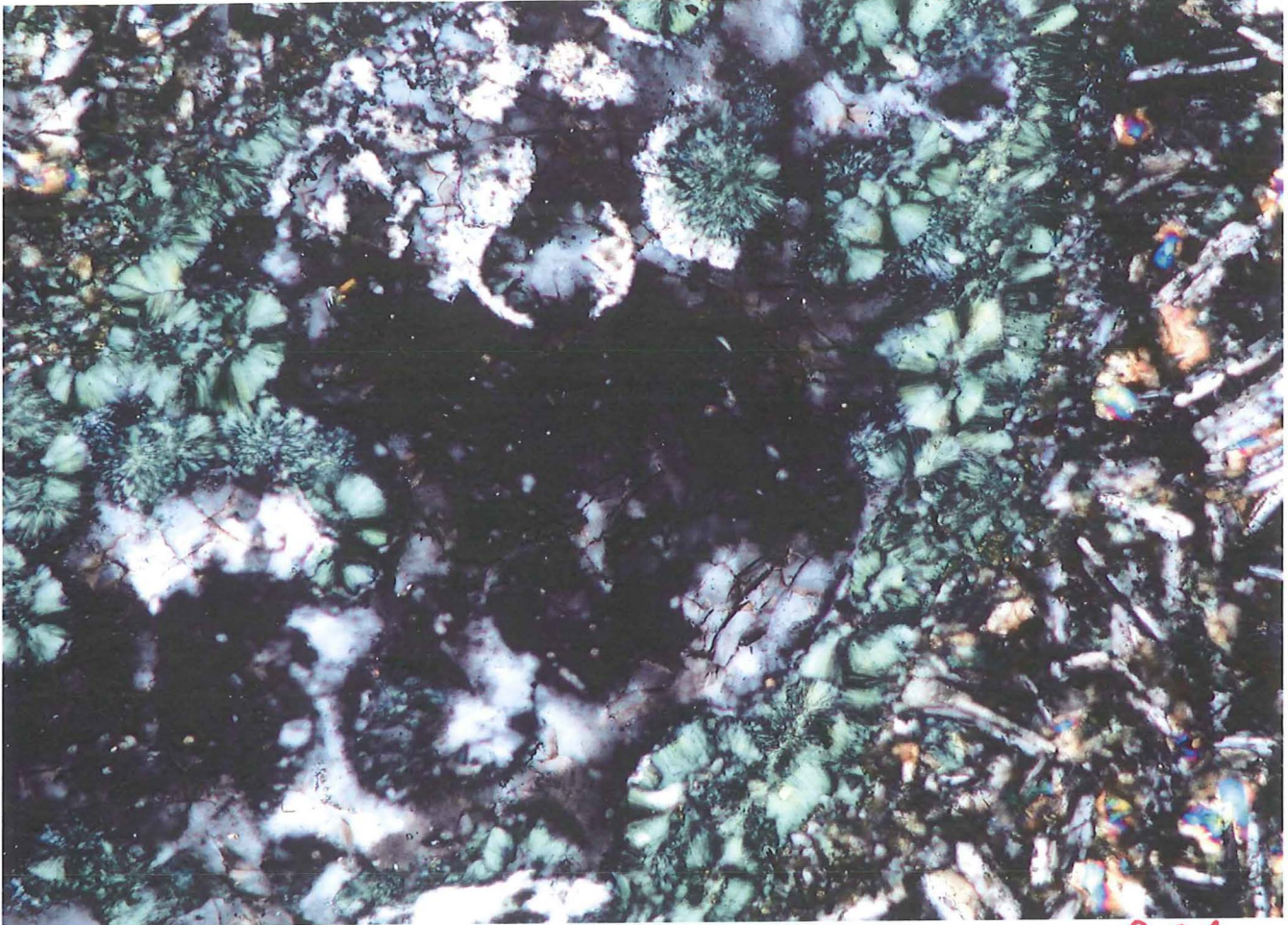
x4



x10



x10 x nicols



x 10 groundmass cpx + feld



x10 plane L8W



3870

perovskite
qtz + chl, ~~epidote~~ + PV ??
very dusty

veins alt. = 4-5"

early qtz → chl →
~~qtz~~

veru

ex

silica flooding

fine grained colorless
epidote? in play

andesite-

plag

cpX

3970

altered

very dusty
chlorite + splene
silicification

epidote? - very fine grained
in plag

andesite

plag
ep?

looks fairly well altered

6

~~but no large epidote~~

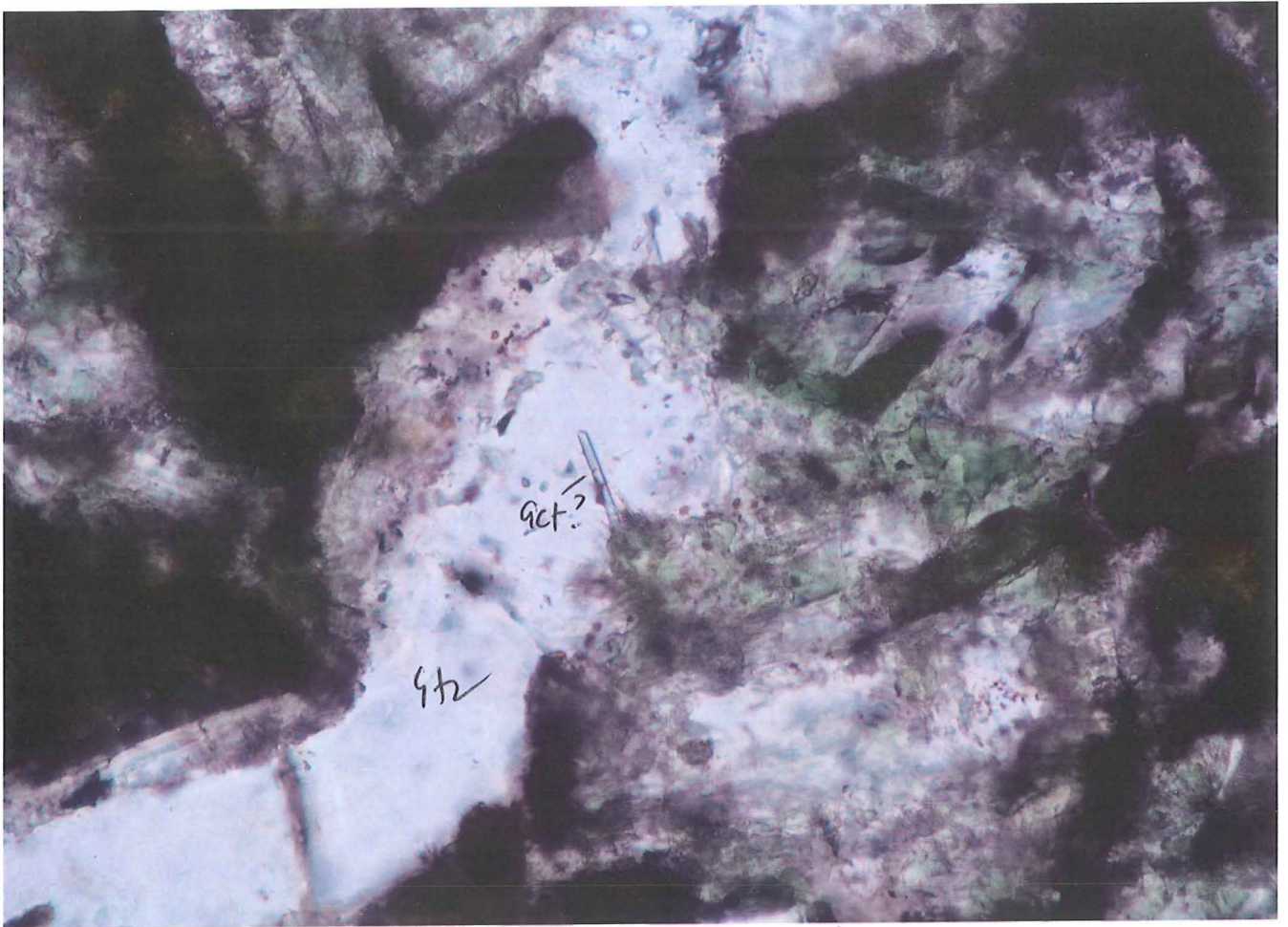
identification of epidote
uncertain, but

small grains in plag probably
ep.

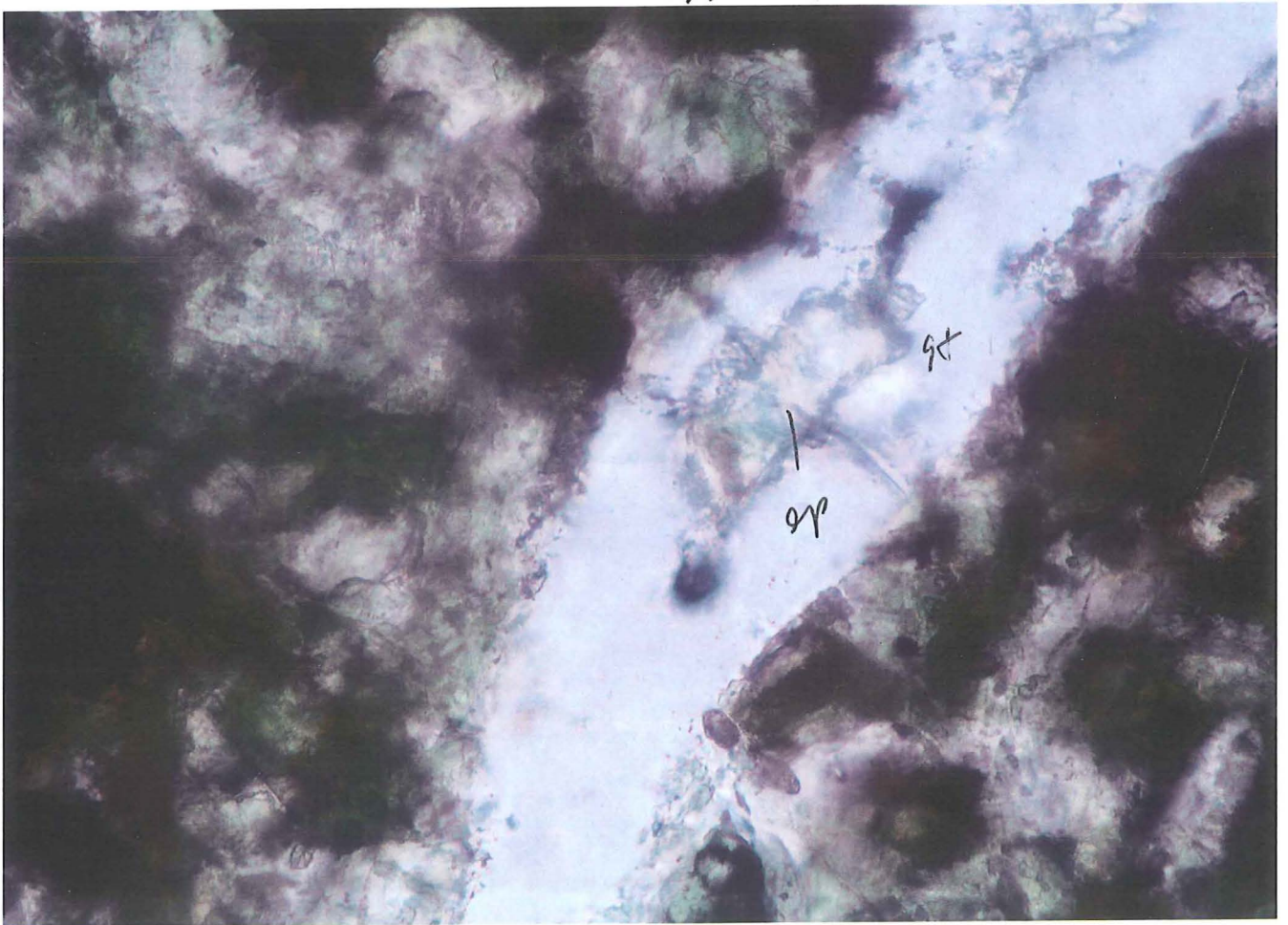
needles of actinolite?

traces of epidote? in Qtz veins
C2

3970 X 40



3970 X 40



x 40

