

PETROGRAPHIC REPORT

CLIENT: Trevor Burr, AngloGoldAshanti
PROJECT/PROPERTY: CR STUDY
SAMPLE NUMBER: CR-0021

BY: James R. Shannon, Ph.D.
SAMPLE TYPE: Polished Thin Section
DATE: 26-June 2017

HAND SAMPLE DESCRIPTION: Core sample from 14.94 m. Black, very fine to fine grained, mylonitic meta-diorite(?) with moderate lineation/foliation. Minor disseminated pyrite. Sample is nonmagnetic with a pencil magnet. Moderate effervescence in spots with dilute HCl.

POLISHED-SECTION DESCRIPTION:

MINERAL	EST %	COMMENTS
RELICT	[21]	
Plagioclase	20	Subhedral, elongated grains up to 0.8 mm; Carlsbad and albite twinning; wavy extinction; local epidote replacement
Mafic Phenocryst	1	Minor remnants of mafic phenocrysts (up to 0.5 mm) replaced by actinolitic amphibole
METAMORPHIC	[70]	Moderate-strong metamorphic overprint
Amphibole	45	Anhedral to subhedral, fibrous grains up to 0.3 mm; distinct yellow-green-bluegreen pleochroism
Plagioclase	20	Recrystallized, very fine mosaics
Epidote	4	Disseminated subhedral grains including small porphyroblasts up to 0.5 mm; Some grains converted(?) to ultrafine mosaics
Quartz	0.3	Minor anhedral grains and patches
Rutile	0.2	Fine disseminated anhedral-subhedral grains up to 0.1 mm
ALTERATION	[5]	
Chlorite	4	Irregular patches up to 0.2 mm; trace remnants of biotite
Carbonate	1	Irregular patches
SULFIDES	[0.6]	
Pyrite	0.5	Subhedral disseminated grains up to 0.3 mm
Chalcopyrite	0.1	Subhedral-anhedral disseminated grains up to 0.05 mm associated with epidote; Locally associated with carbonate veinlets; Locally as inclusions in pyrite
VEINLETS	[2]	
Carbonate	2	Discontinuous veinlets up to 0.5 mm with chalcopyrite

TEXTURES

The sample displays a relict very fine to fine grained diorite texture with suggestions of minor remnant mafic phenocrysts. About one half of plagioclase exhibits remnant subhedral lath texture, but is probably recrystallized. Significant plagioclase has been grain size reduced to irregular patches of plagioclase mosaic intergrown with amphibole and minor quartz. All primary mafics have been recrystallized to green-bluegreen actinolitic amphibole. The amphibole is micro-lineated (foliated) along irregular microshear bands.

In general, the sample lacks uniform penetrative deformation fabrics. Deformation appears to be heterogeneous, focused along irregular shear bands that outline remnants knots of metadiorite.

The sample has locally abundant epidote that occurs as microporphyroblasts and disseminated grains. It locally replaces plagioclase and appears to be part of the metamorphic assemblage. Weak alteration includes the development of irregular chlorite and carbonate patches. Traces of remnant biotite suggest the chlorite may replace metamorphic biotite.

METAMORPHIC OVERPRINT

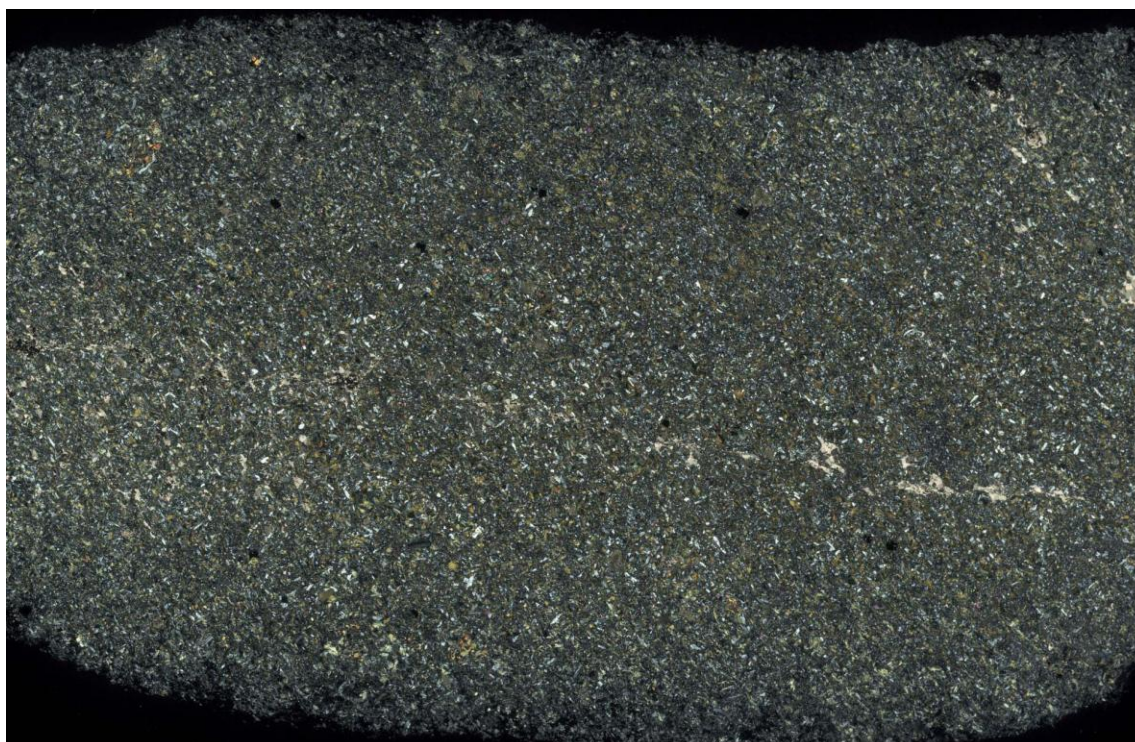
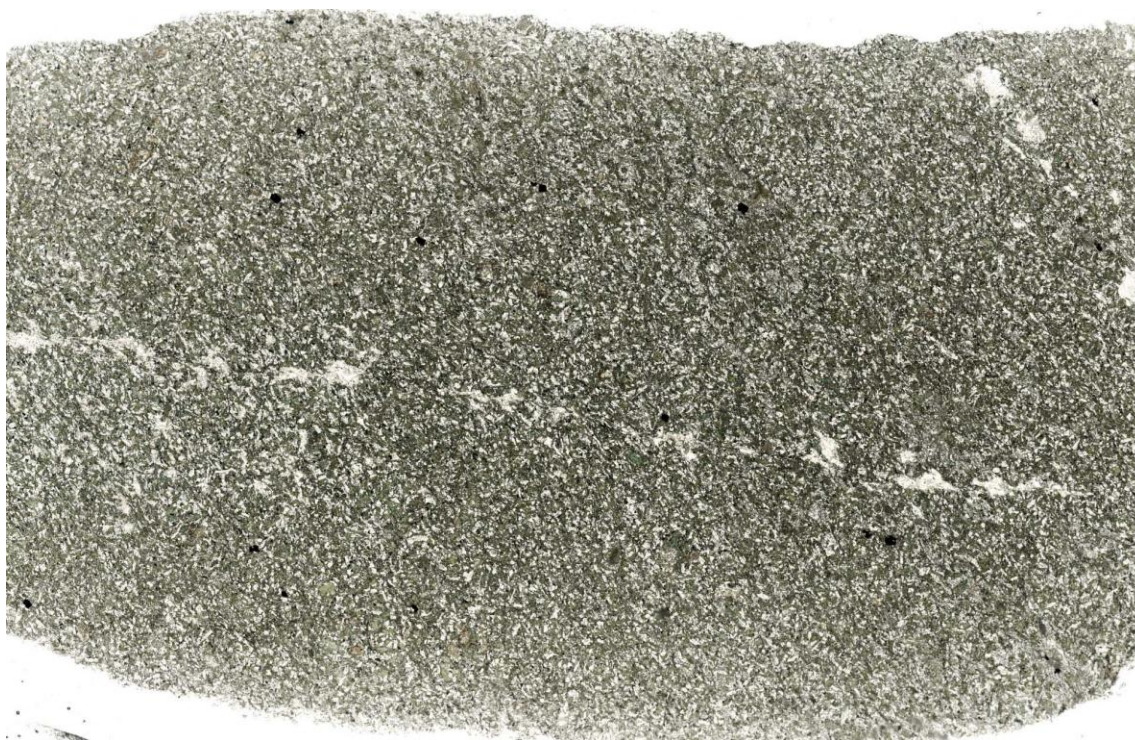
The sample has a moderate-strong metamorphic overprint with an assemblage of: actinolite-albite(?)-epidote-biotite(?). The assemblage suggests medium metamorphic grade equivalent to amphibolite facies. Metamorphism appears to be dominantly thermal with associated heterogeneous deformation.

MINERALIZATION

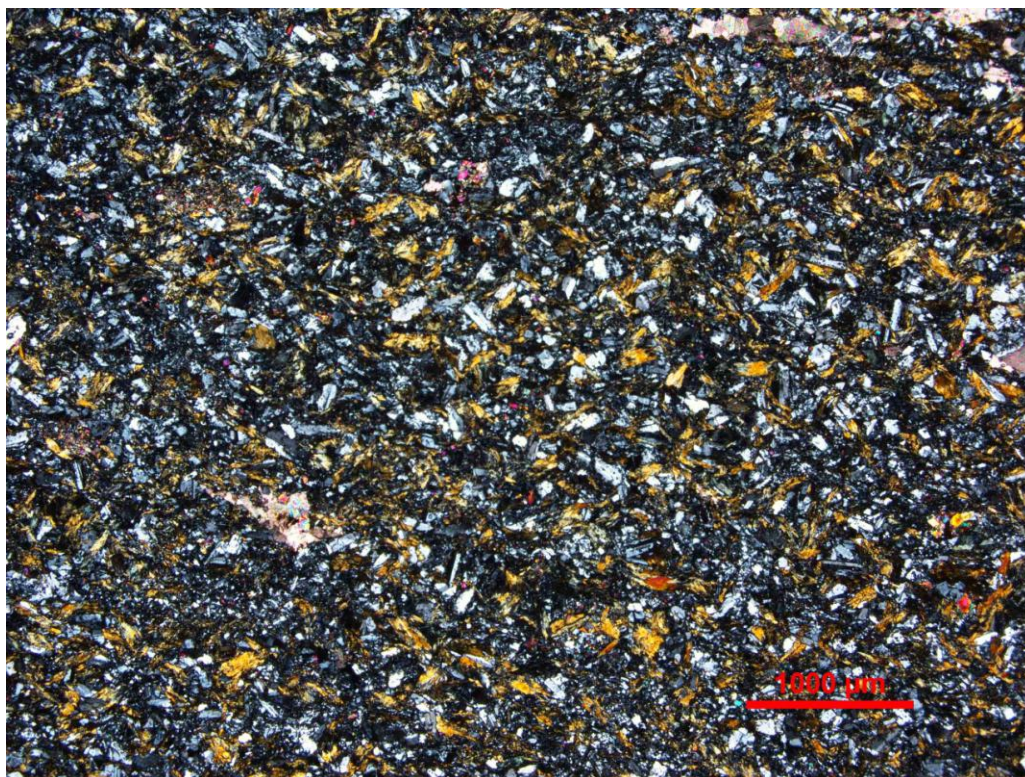
Minor mineralization includes disseminated pyrite and chalcopyrite. The local association with epidote suggests sulfides were introduced or remobilized during metamorphic overprinting.

ROCK NAME: Actinolite-Epidote Meta-Diabase

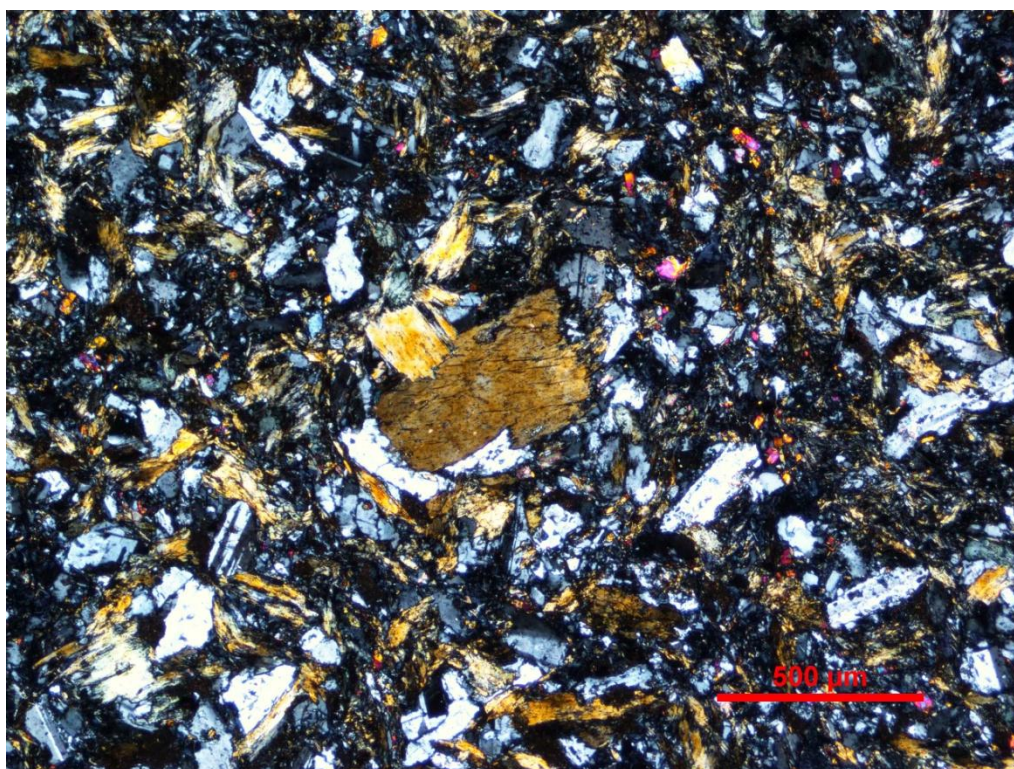
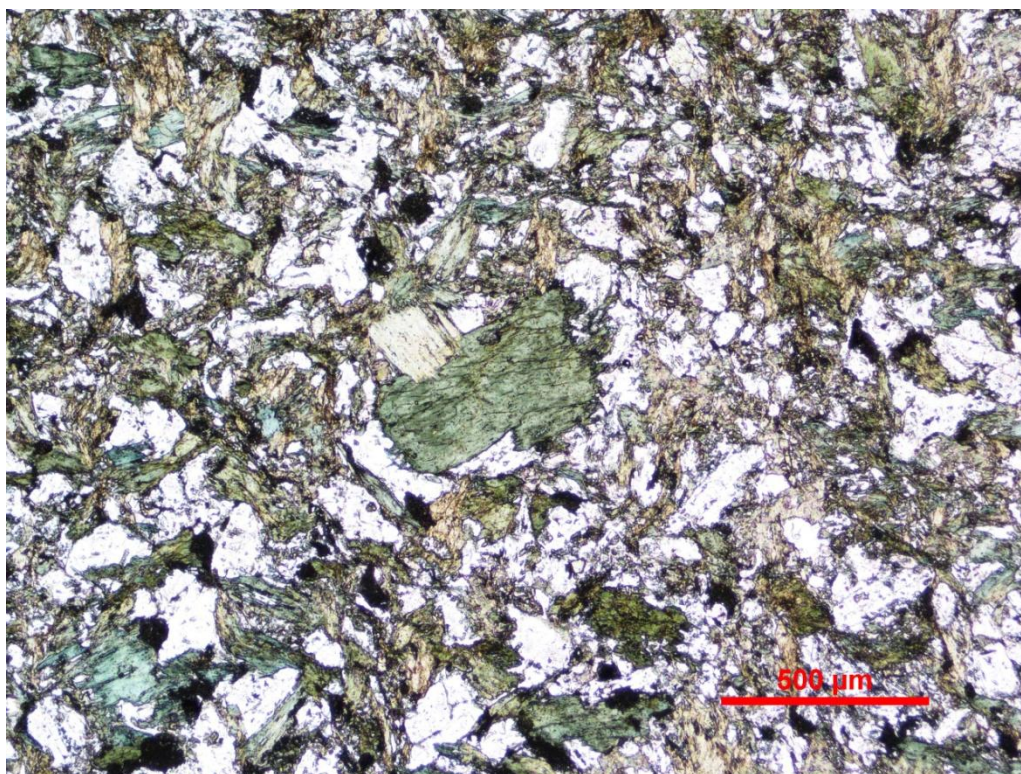
PROTOLITH: Mafic diabasic/gabbroic rock with microporphyritic texture



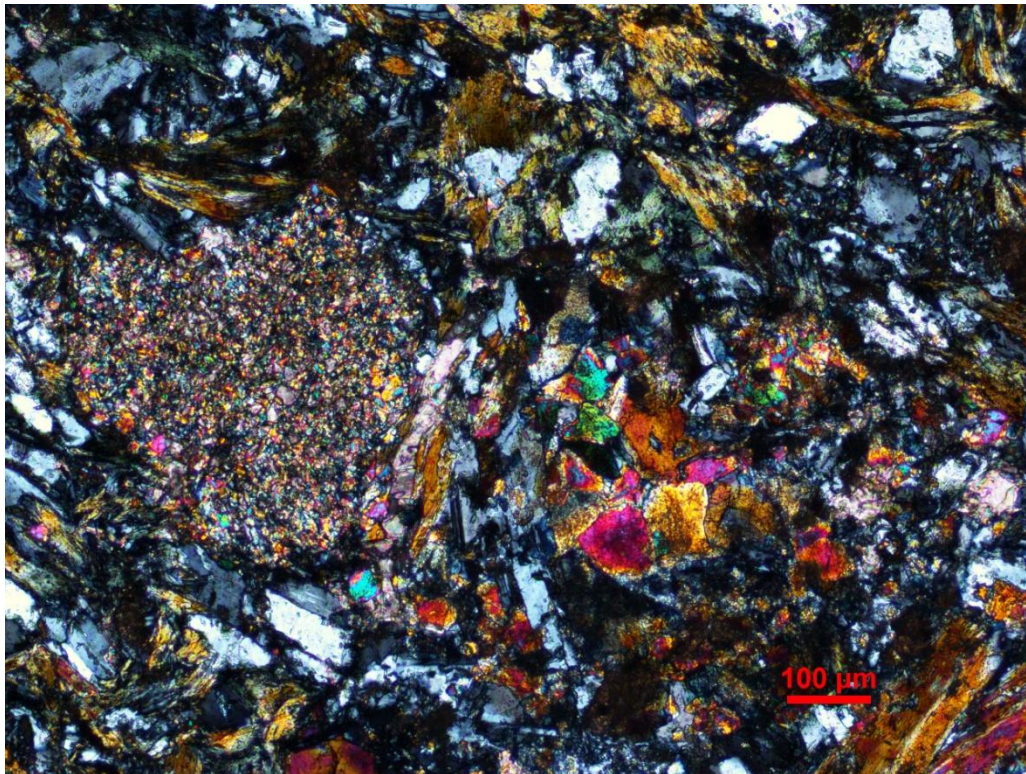
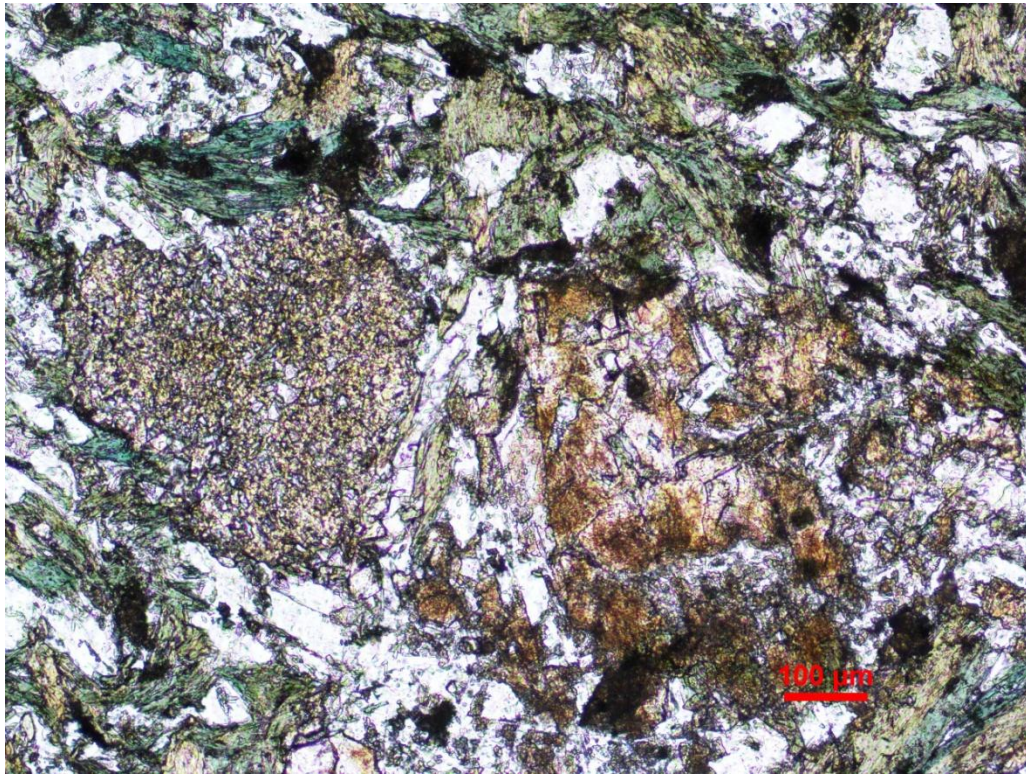
Sample CR-0021. Wide-field, full-thinsection view showing very fine to fine grained diabase texture with metamorphic overprint. Top- plane light; Bottom- crossed polarizers. 3.6 cm across.

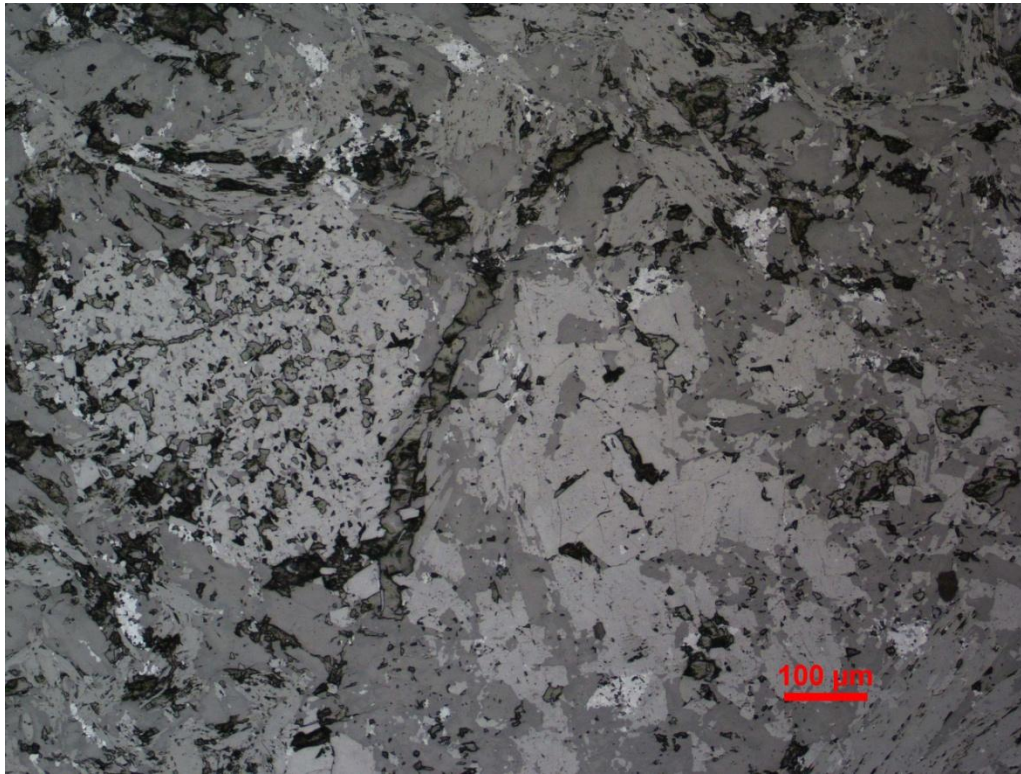


Sample CR-0021. Strongly actinolitized metadiabase with relict plagioclase lath texture. Top-plane light; Bottom- crossed polarizers.

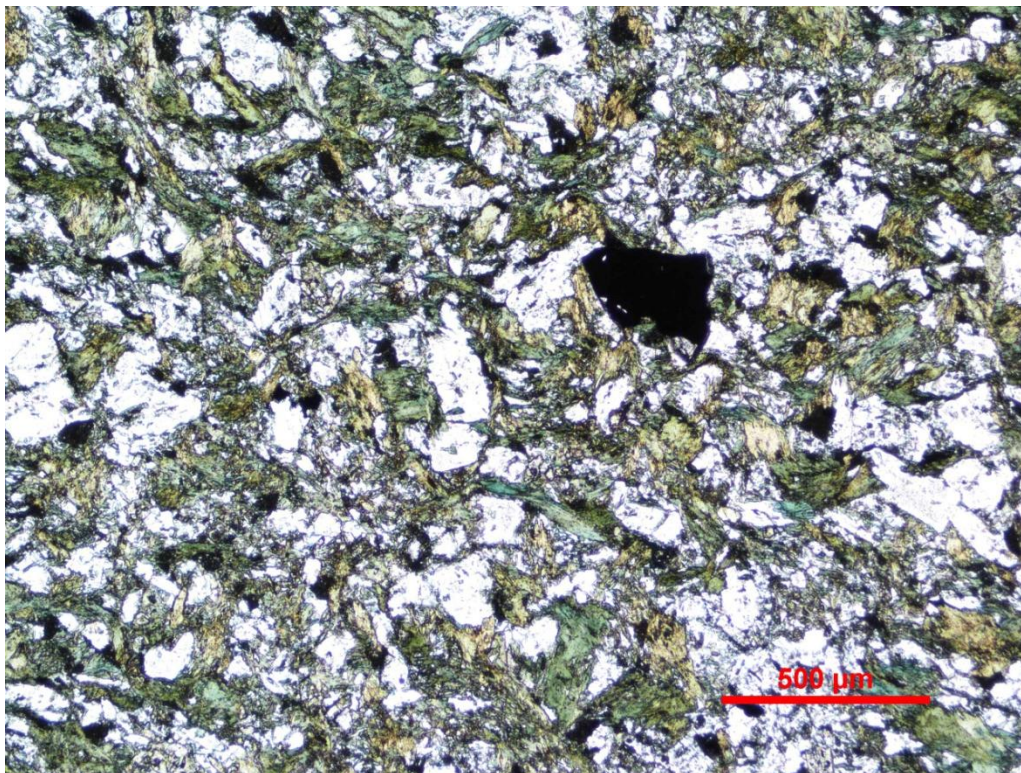


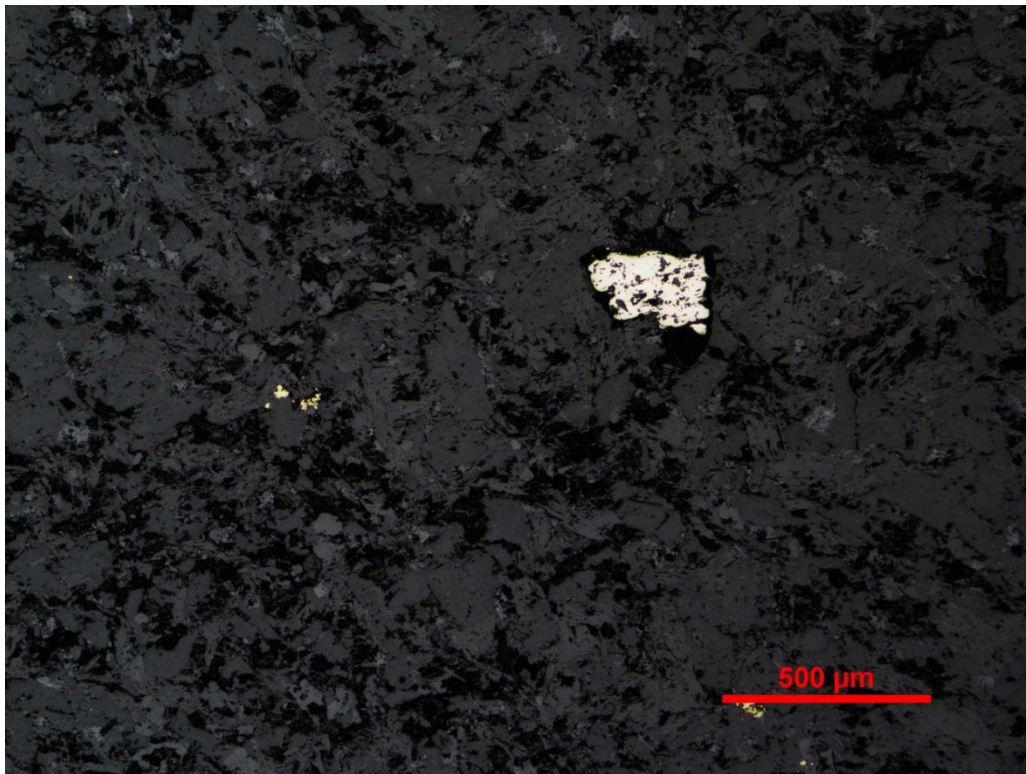
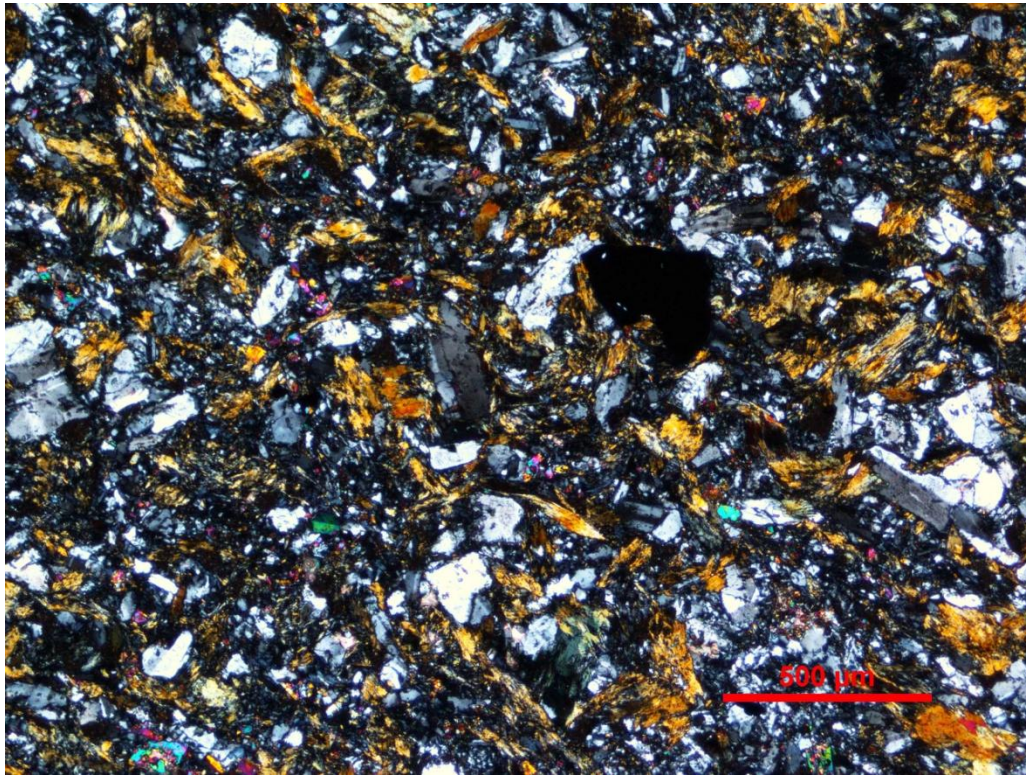
Sample CR-0021. Amphibole porphyroblast possibly after primary mafic phenocryst. All primary mafic replaced by green-bluegreen actinolitic amphibole. Top- plane light; Bottom- crossed polarizers.



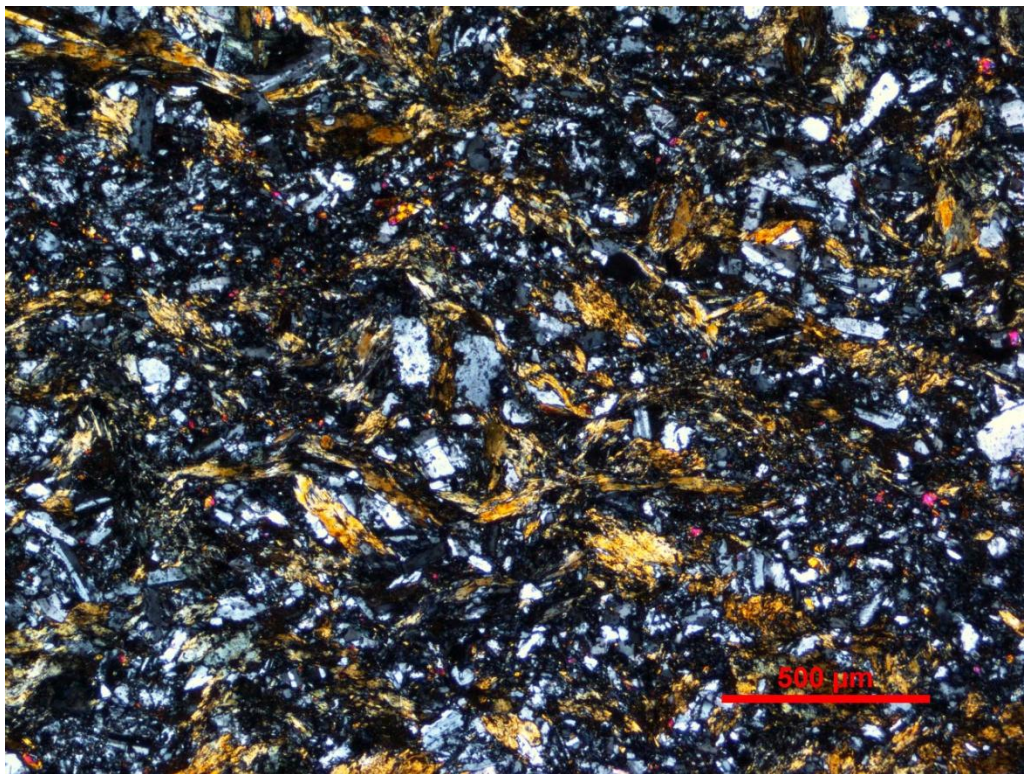
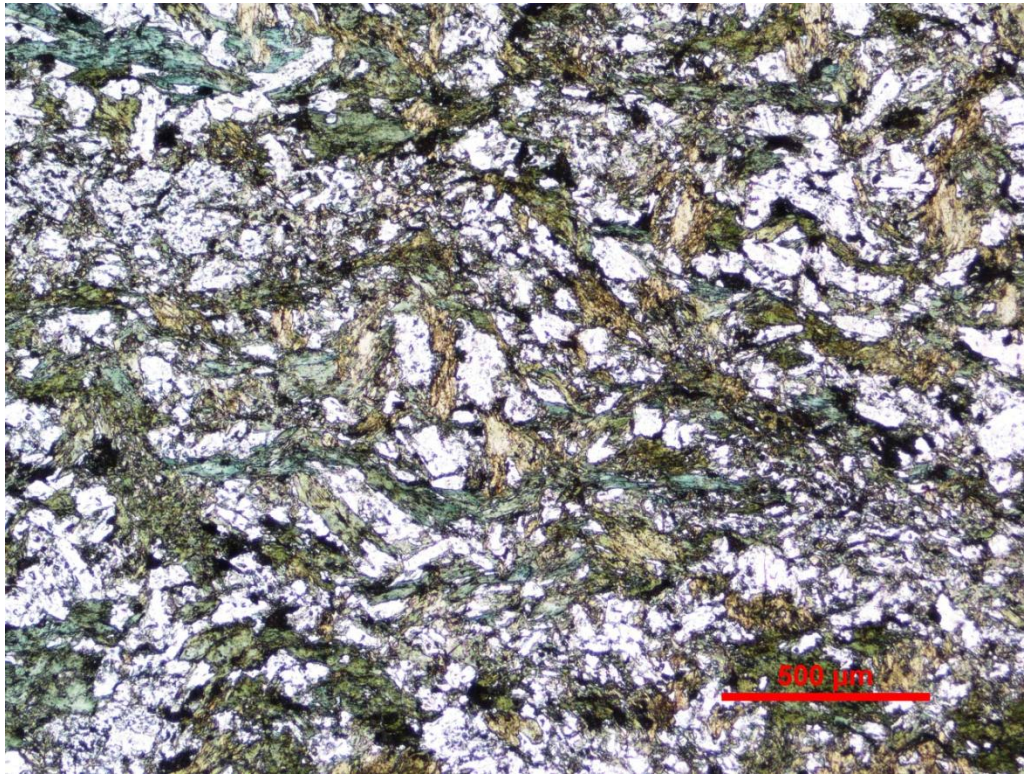


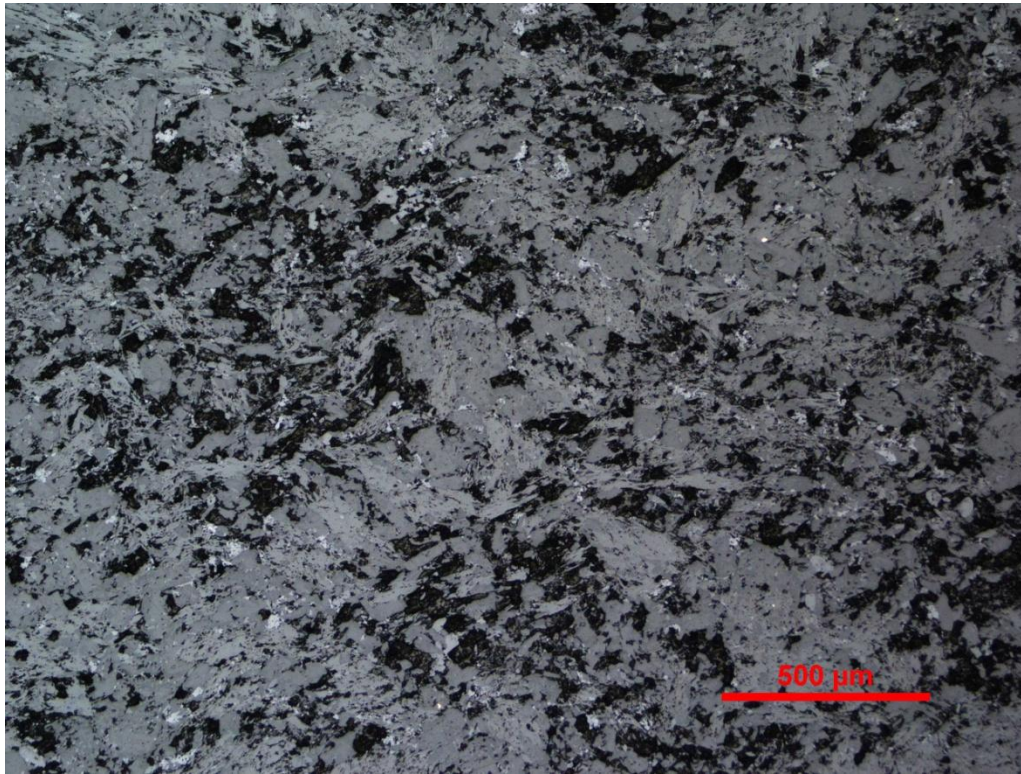
Sample CR-0021. Epidote microporphyroblasts. Note very fine mosaic texture in grain at left. Top-plane light; Middle- crossed polarizers; Bottom- reflected light.



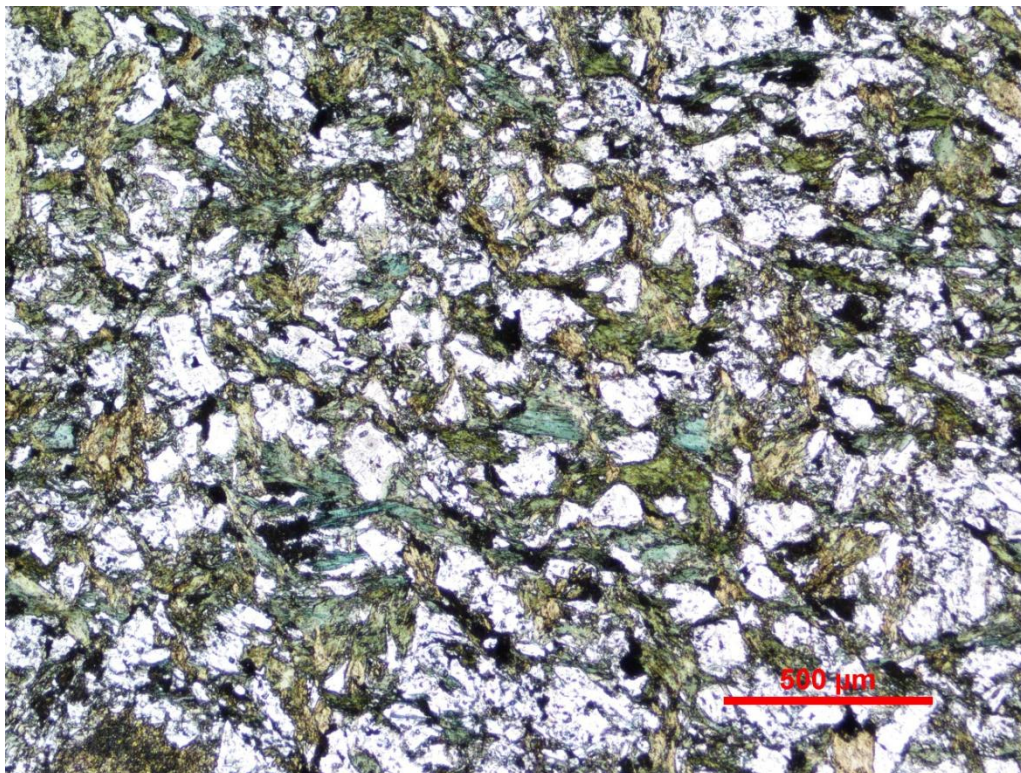


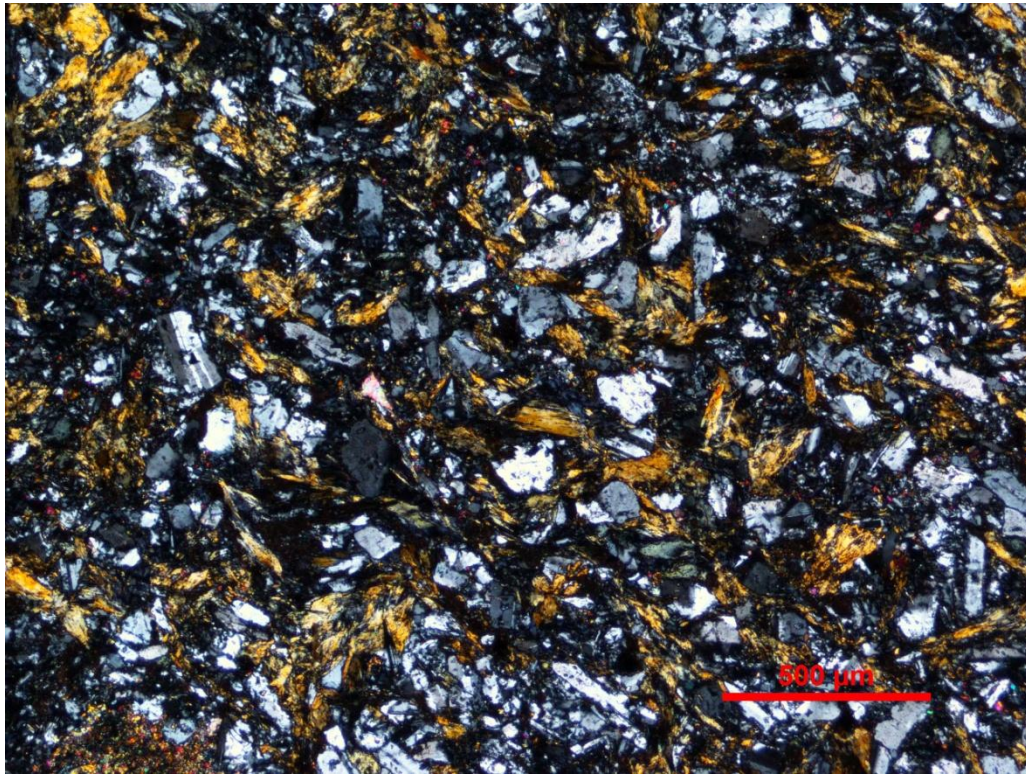
Sample CR-0021. Peculiar microporphyritic texture with grain-size reduced(?) matrix. Disseminated pyrite (right) and chalcopyrite (left). Top- plane light; Middle- crossed polarizers; Bottom- reflected light.



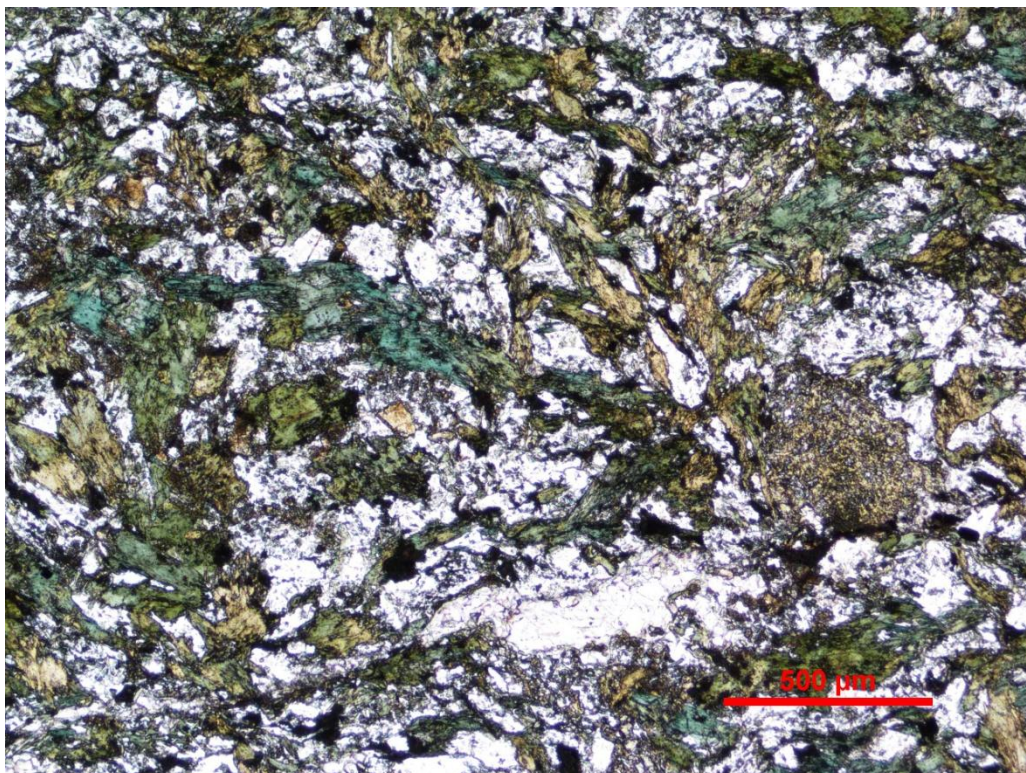


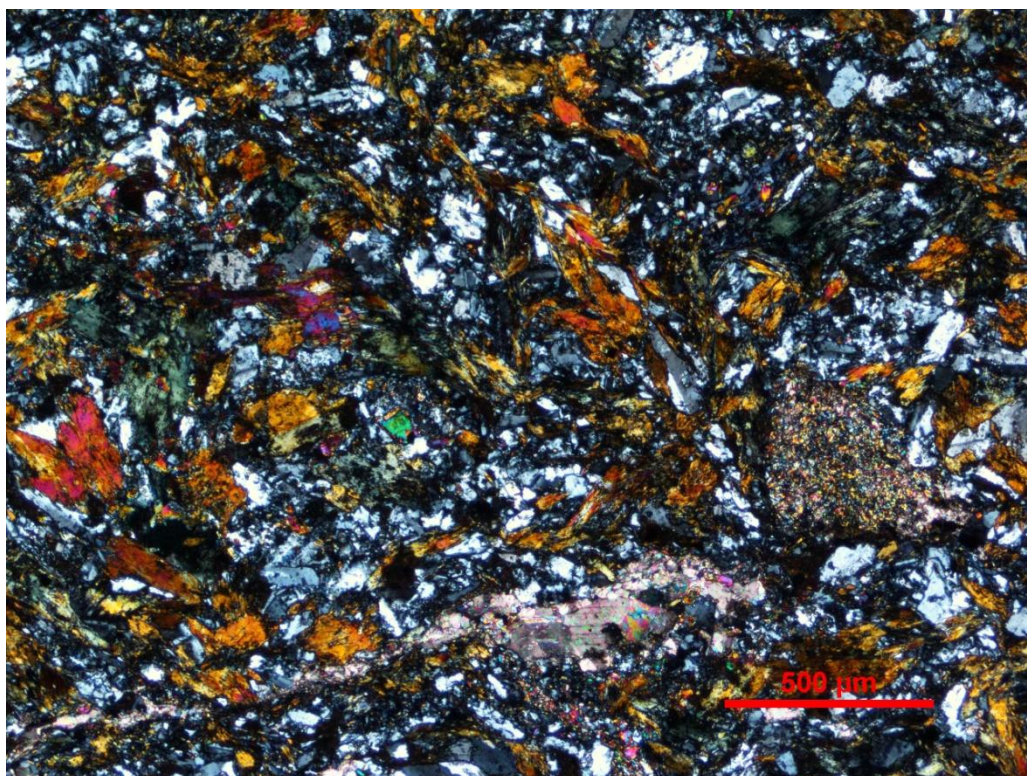
Sample CR-0021. Relict 'knots' of diabase with irregular microshears and localized grain size reduction. Top- plane light; Bottom- crossed polarizers.



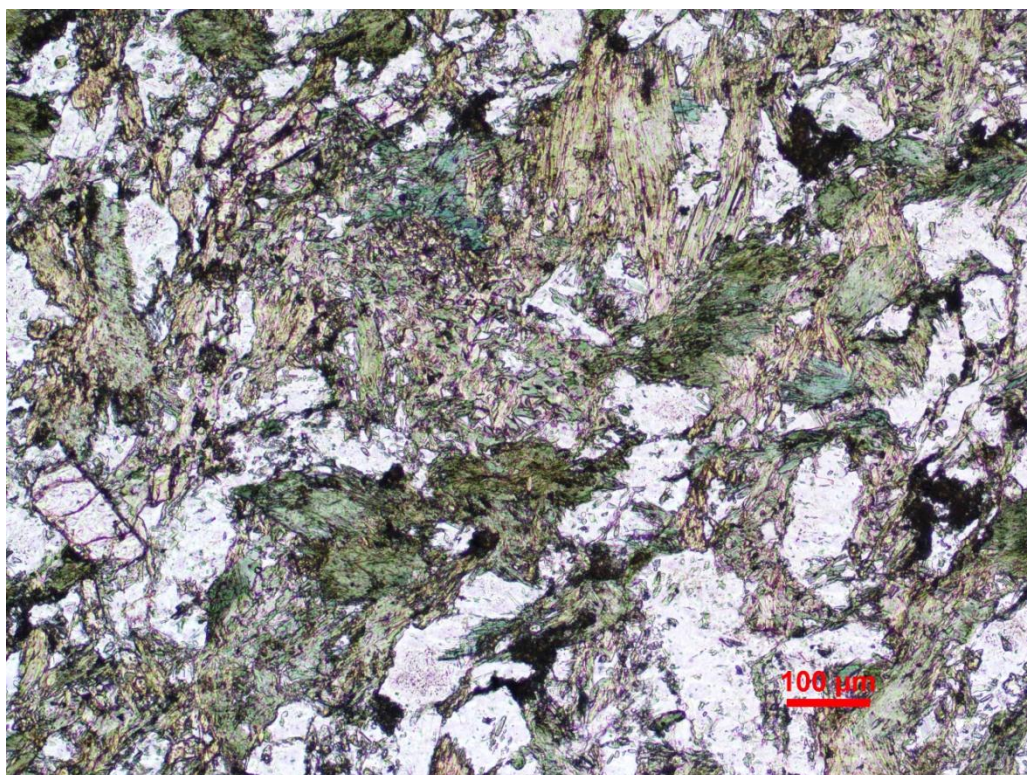


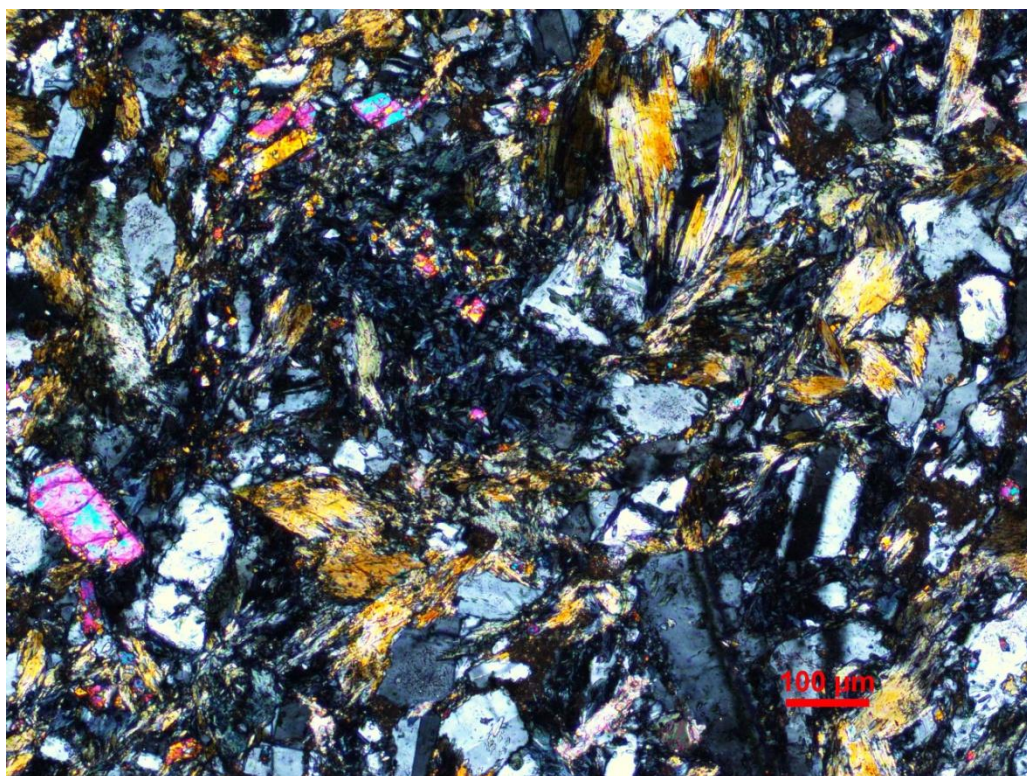
Sample CR-0021. More microshears and localized grain size reduction in metadiabase. Top- plane light; Bottom- crossed polarizers.



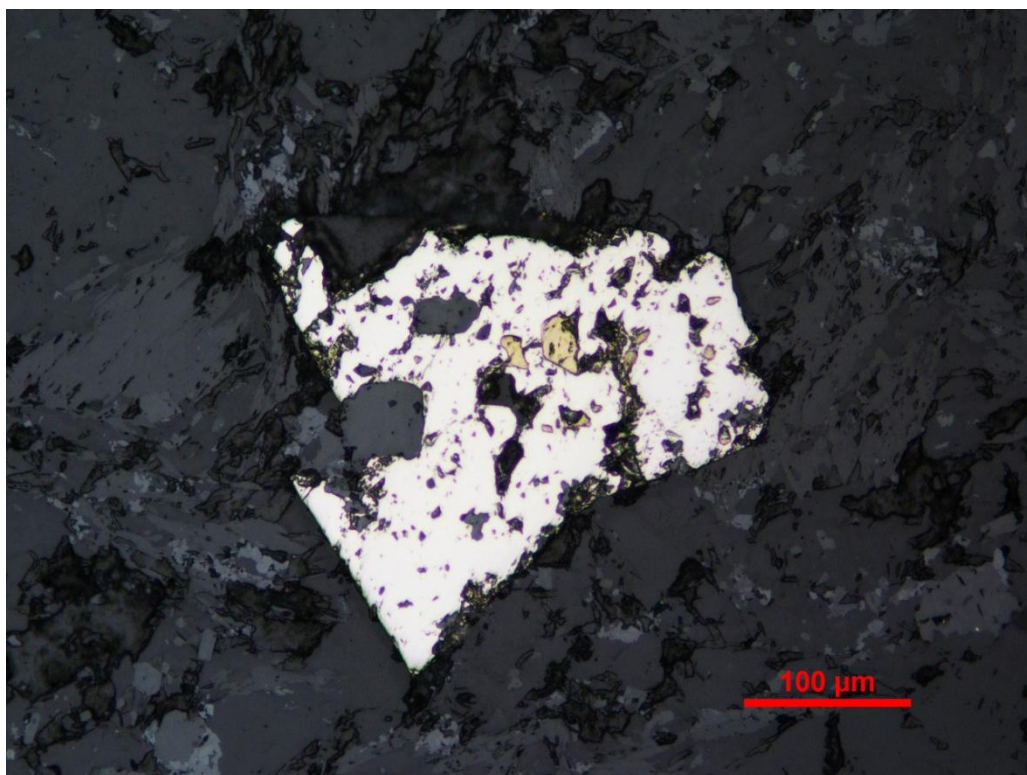


Sample CR-0021. Microshear bands with patchy carbonate (bottom center). Top- plane light; Bottom- crossed polarizers.

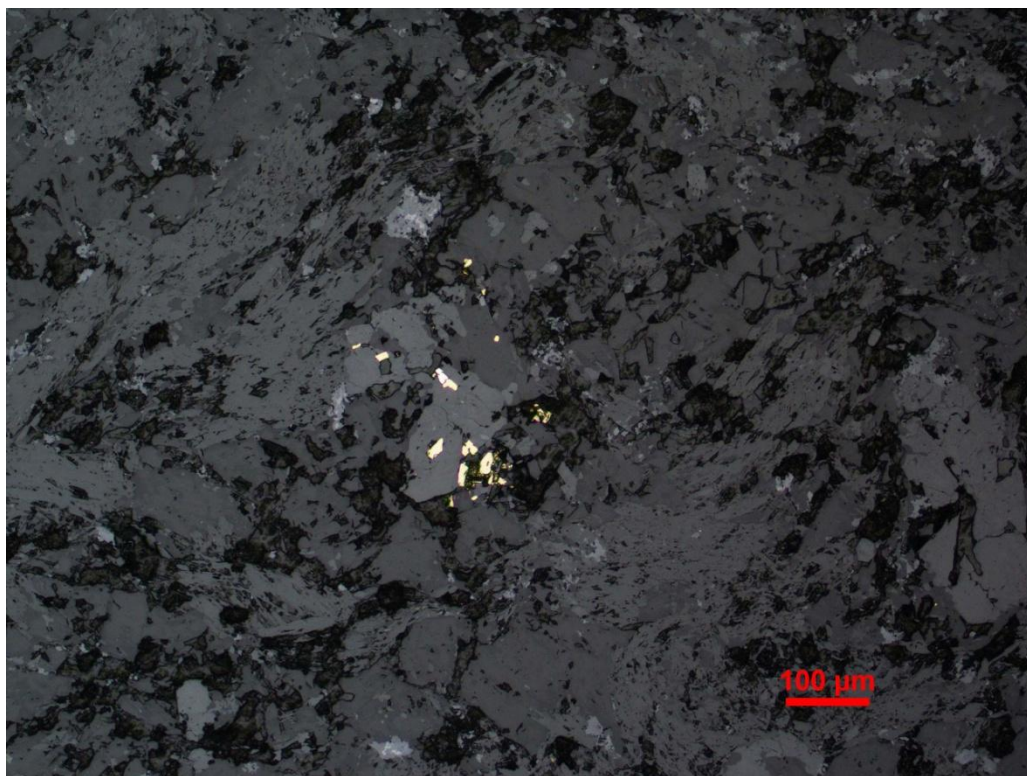
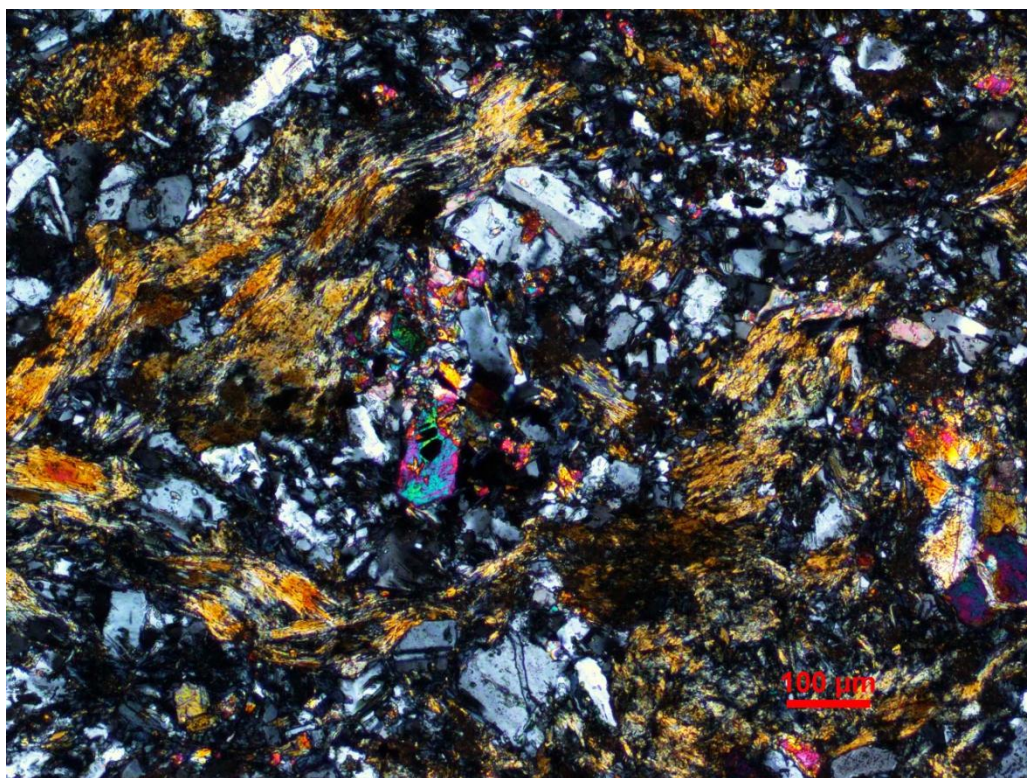




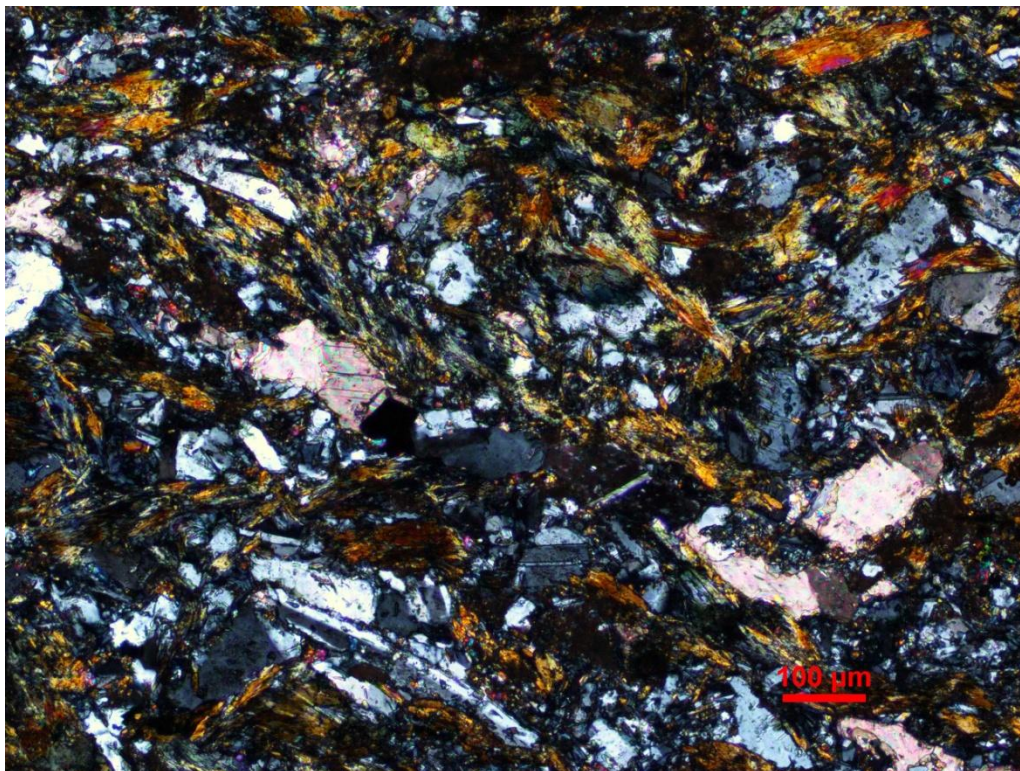
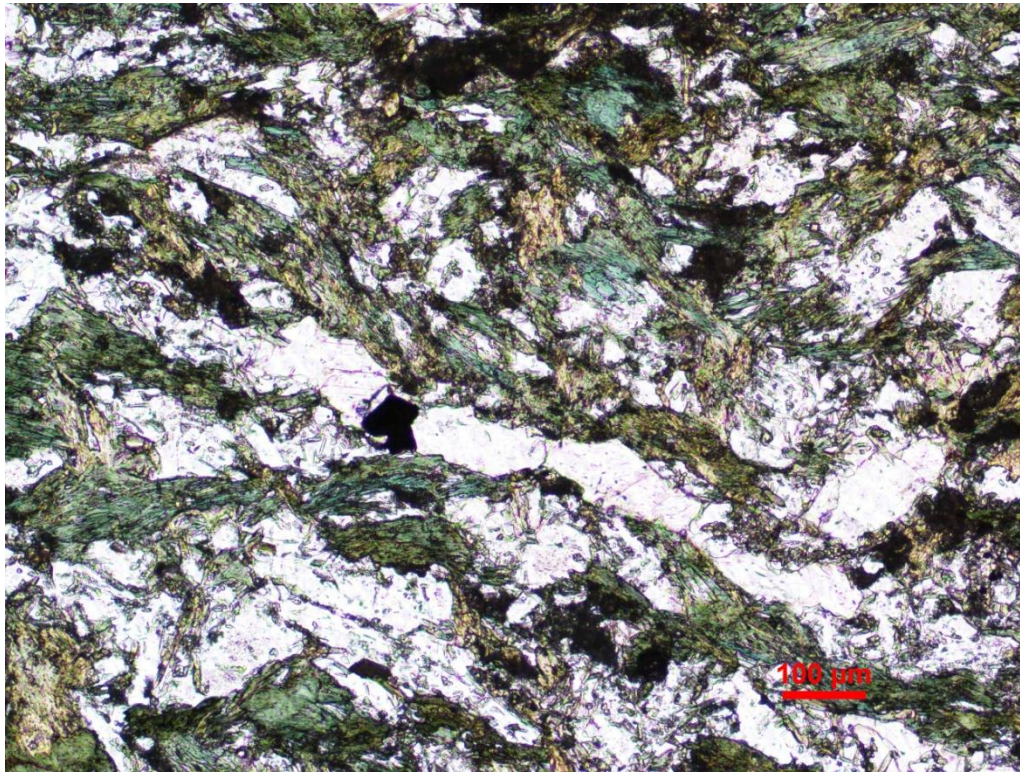
Sample CR-0021. Chlorite alteration patch with traces remnant biotite. Top- plane light; Bottom- crossed polarizers.



Sample CR-0021. Disseminated pyrite with chalcopyrite inclusions. Reflected light.



Sample CR-0021. Disseminated chalcopyrite associated with epidote. Top- crossed polarizers; Bottom- reflected light.





Sample CR-0021. Chalcopyrite associated with irregular carbonate veinlet. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.