

PETROGRAPHIC REPORT

CLIENT: Trevor Burr, AngloGoldAshanti
PROJECT/PROPERTY: CR STUDY
SAMPLE NUMBER: CR-0031

BY: James R. Shannon, Ph.D.
SAMPLE TYPE: Polished Thin Section
DATE: 28-June 2017

HAND SAMPLE DESCRIPTION: Core from 27.1 m shows dark greenish gray, very fine to fine grained, mylonitic amphibolite with weak foliation and moderate lineation. The sample is weak-moderate magnetic with a pencil magnet. The sample does not effervesce with dilute HCL but there is a reaction from thin carbonate veinlets in the core.

POLISHED-SECTION DESCRIPTION:

MINERAL	EST %	COMMENTS
METAMORPHIC		
PORPHYROBLAST	[5]	
Epidote	5	Subhedral microporphyroblasts up to 0.3 mm in chlorite shear(?) bands
MATRIX	[80]	
Amphibole	35	Subhedral-anhedral, elongated grains up to 0.8 mm; Distinct bluegreen pleochroism suggests actinolitic composition; Moderately lineated
Plagioclase	25	Anhedral, mostly untwinned grains up to 0.3 mm; Intergrown with amphibole and quartz; Minor albite twinning
Quartz	15	Anhedral grains up to 0.05 mm intergrown with plagioclase and amphibole
CHLORITE BANDS	[35]	
		Shear(?) bands with strongly oriented, foliated chlorite matrix; Includes epidote micro-porphyroblasts(above) and 'fragments' of amphibolite
Chlorite	15	Light green, anhedral, optically oriented
ACCESSORY	[2.2]	
Magnetite	2	Anhedral grains up to 0.2 mm
Ilmenite	0.2	Anhedral-subhedral grains up to 0.07 mm
SULFIDES	[1.1]	
Pyrite	1	Subhedral grains up to 0.4 mm; Disseminated in amphibolite and locally associated with epidote
Chalcopyrite	0.1	Subhedral-anhedral disseminated grains up to 0.03 mm

TEXTURES

The sample displays a very fine to fine grained, amphibolite texture with suggestions of a penetrative deformation fabric including moderate lineation of amphibole and weak-moderate foliation of chlorite. The amphibolite has irregular shear(?) bands (about 35 percent) with a weak-moderate foliated chlorite matrix. The 'shear' bands appear to be interlayered with amphibolite suggesting an incipient gneissic fabric. The 'shear' bands locally have sheared off

fold forms. The chlorite shear bands have preferential development of epidote microporphyroblasts.

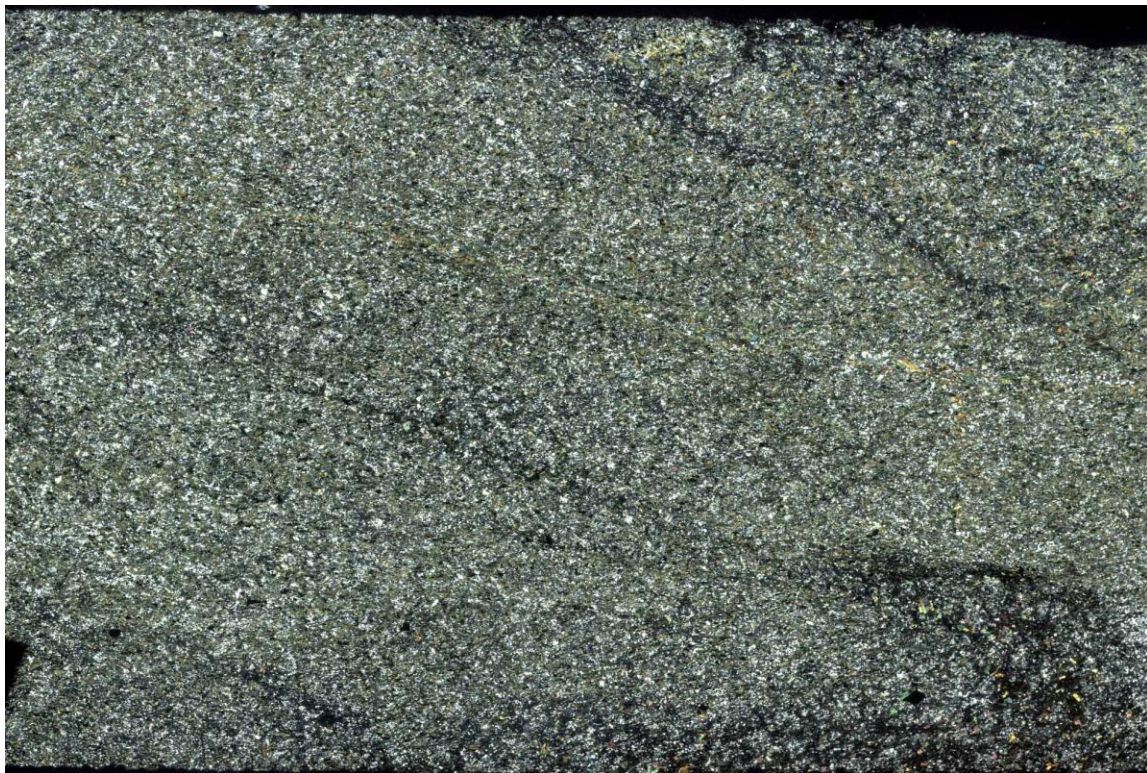
The amphibolite has distinct bluegreen pleochroic amphibole suggesting an actinolitic composition. Elongated amphibole is moderately oriented (lineated) and intergrown with plagioclase and quartz. Plagioclase has minor relict twinning. The amphibolite was completely recrystallized during metamorphism, and does not have relict minerals or textures from the protolith. The amphibolite has accessory magnetite and minor ilmenite.

METAMORPHISM

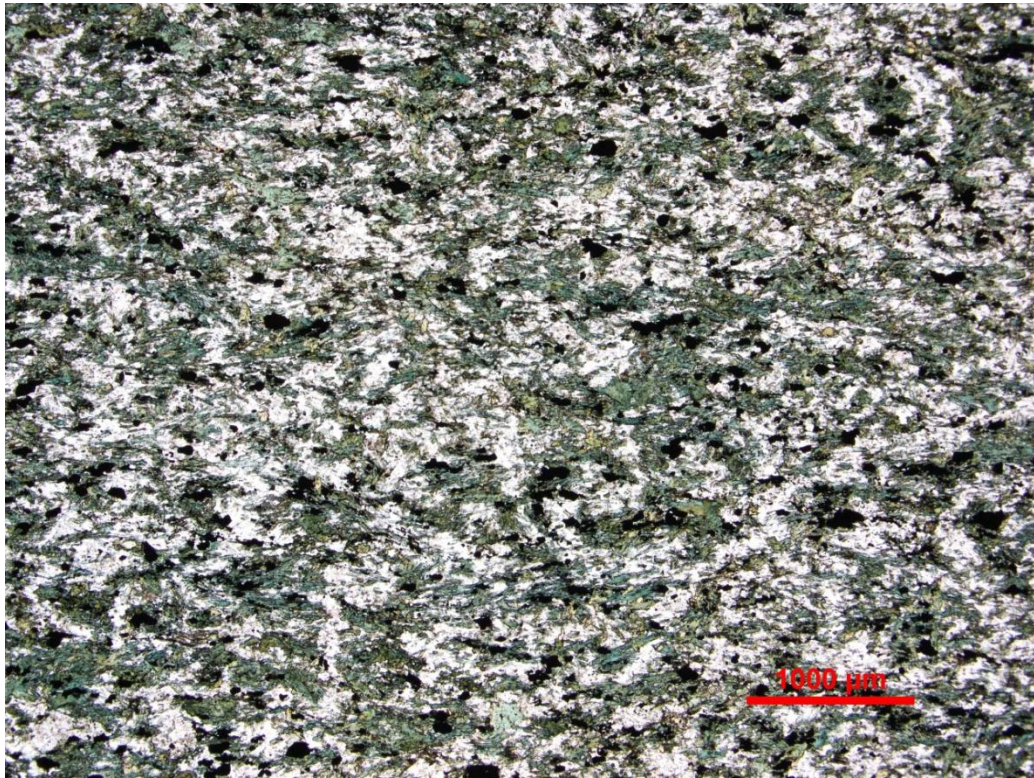
The sample has a main metamorphic assemblage of actinolitic amphibole-plagioclase-quartz indicating a medium-grade metamorphism equivalent to amphibolite facies. The amphibolite exhibits a penetrative lineation fabric. The chlorite-epidote 'shear' bands appear to be superimposed on the amphibolite and represent a younger, retrograde metamorphism/alteration. The chlorite-epidote assemblage suggests a lower grade metamorphism equivalent to greenschist facies. They have 'fragments' of amphibolite in an oriented (foliated) chlorite matrix. The chlorite-epidote bands appear to be micro-folded along with amphibolite suggesting a syn- or post-retrograde deformation event.

ROCK NAME: Actinolite Amphibolite With Retrograde Chlorite-Epidote

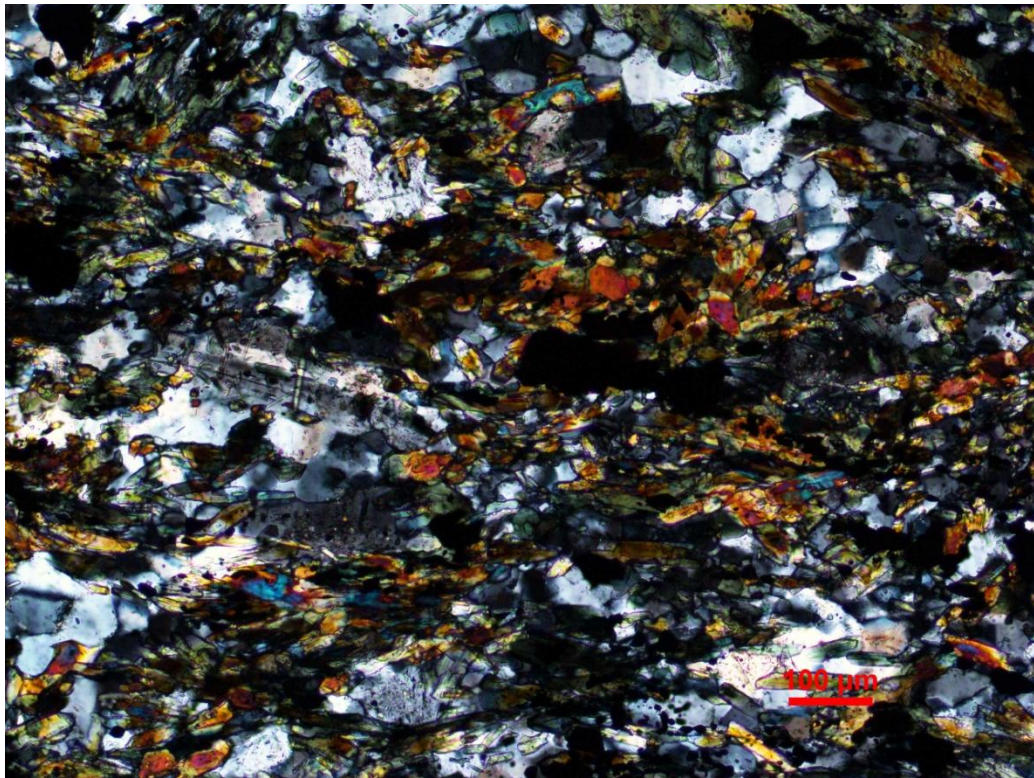
PROTOLITH: Uncertain protolith; Mafic composition

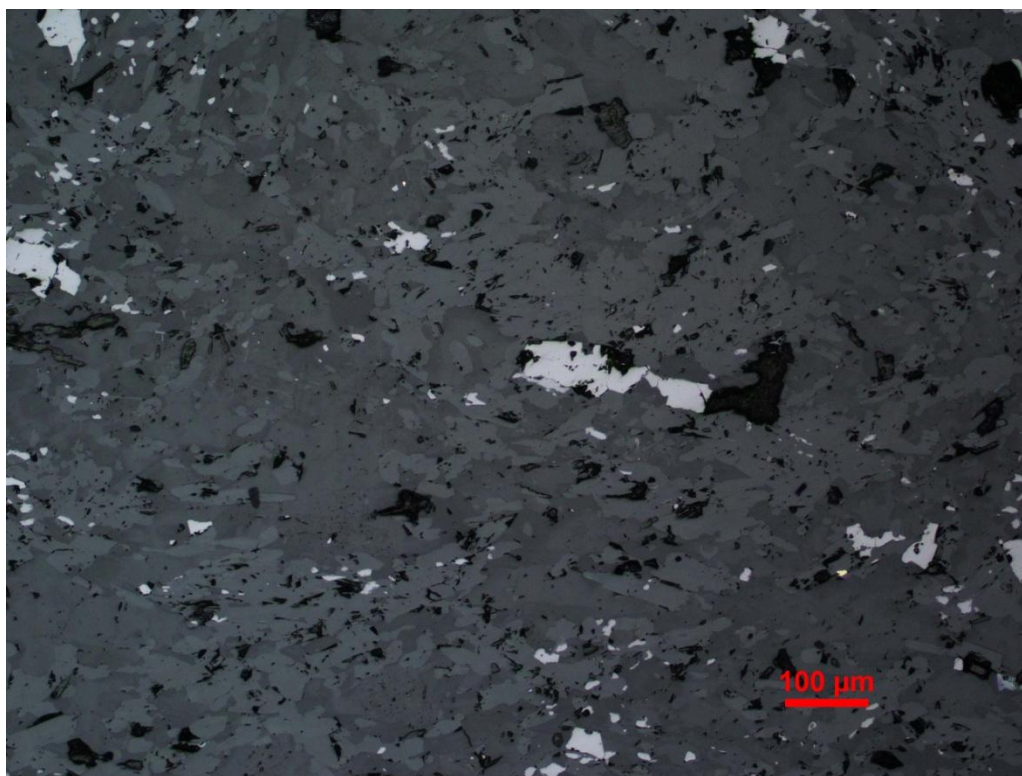


Sample CR-0031. Wide-field, full-thinsection view showing very fine to fine grained amphibolite with irregular, folded, chlorite-epidote gneissic banding. Top- plane light; Bottom- crossed polarizers.

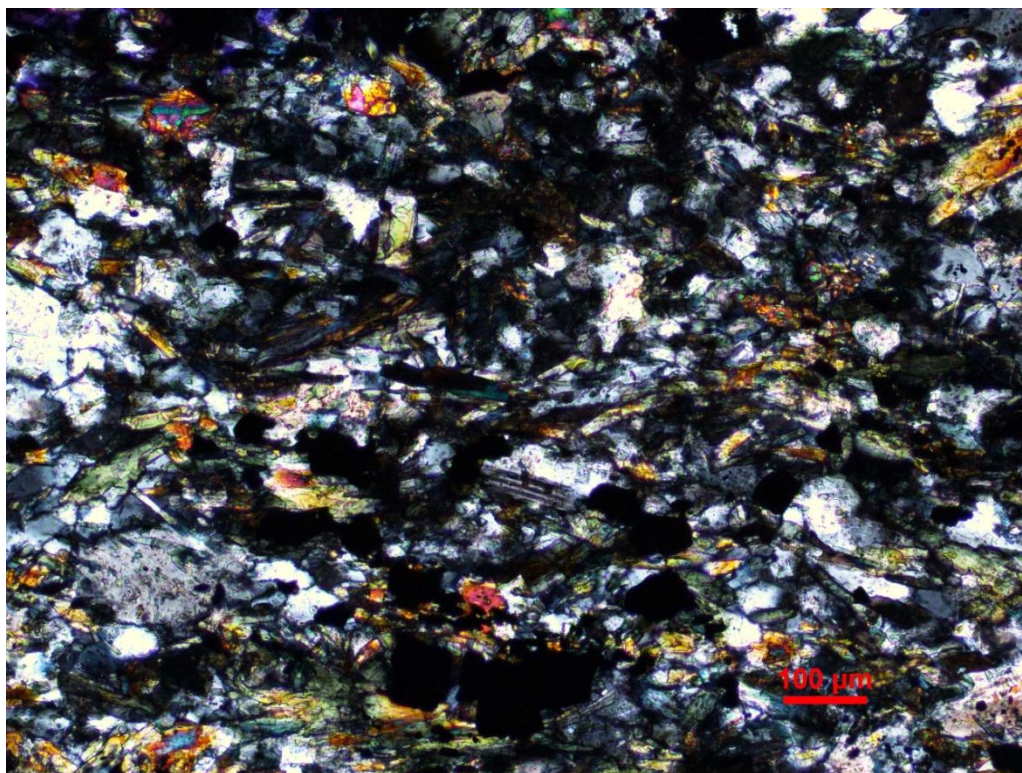


Sample CR-0031. Amphibolite with moderate foliation/lineation related to shear bands. Top-plane light; Bottom- crossed polarizers.



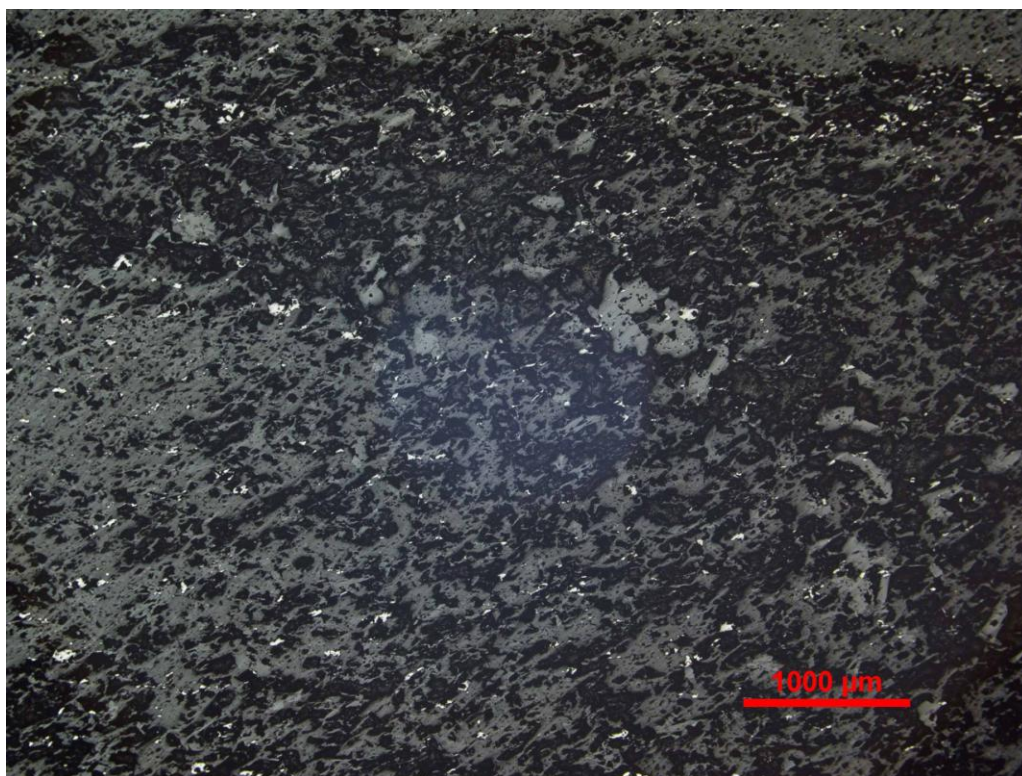


Sample CR-0031. Blue green actinolitic amphibole, twinned plagioclase, and magnetite in lineated amphibolite. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.

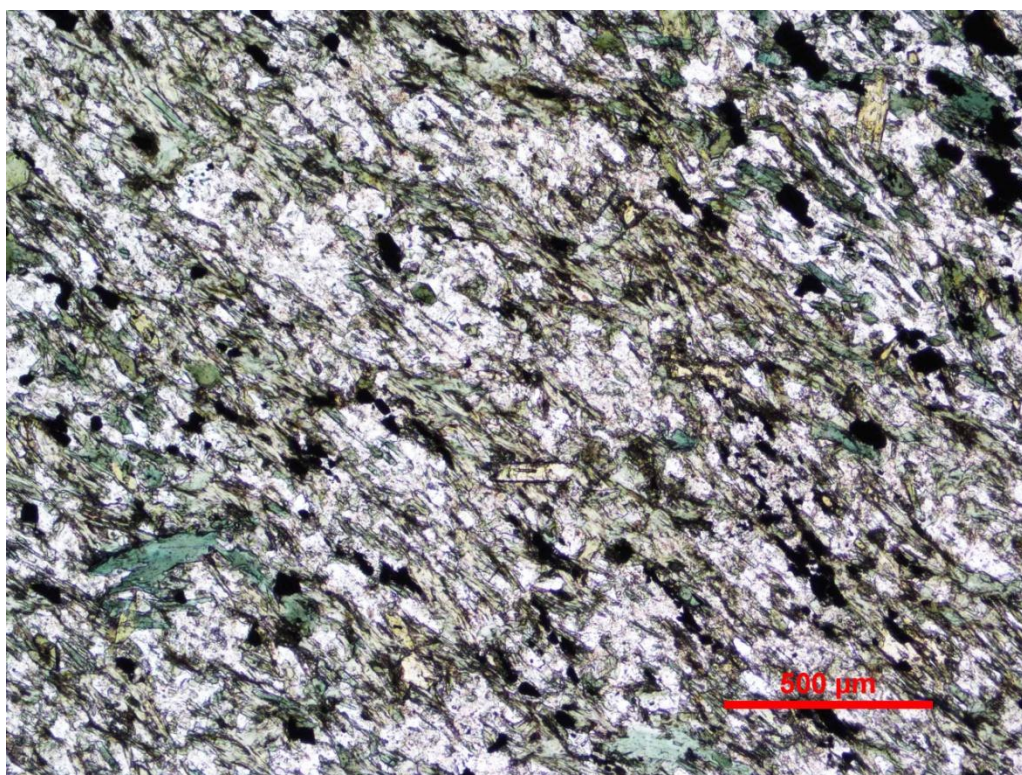


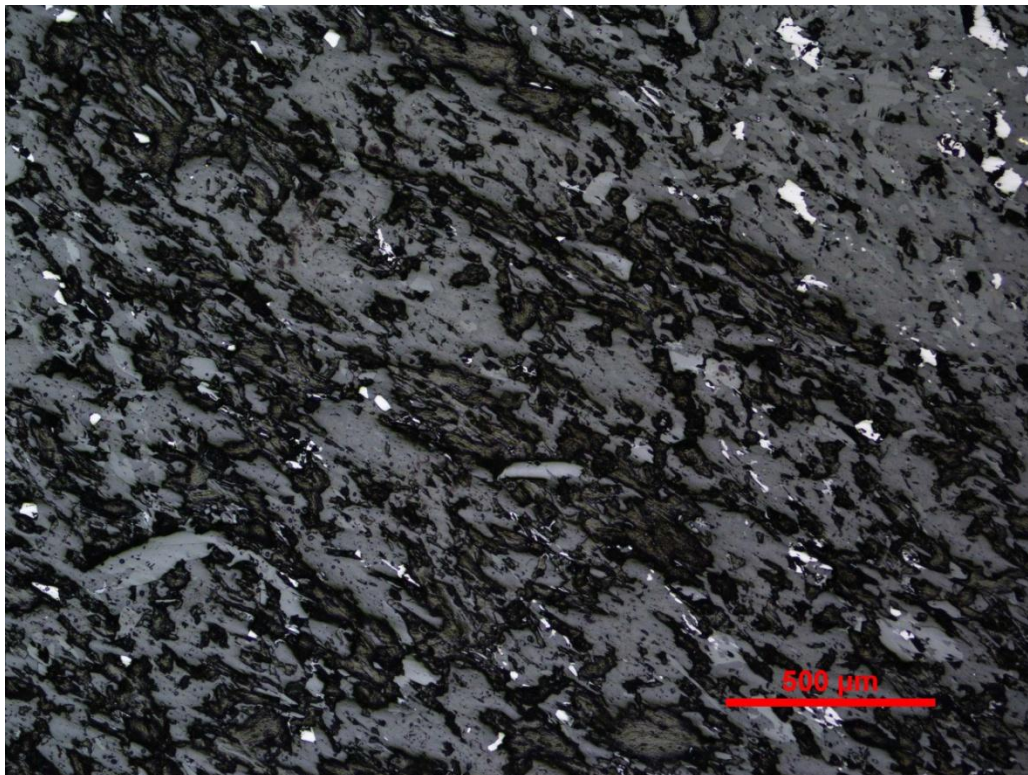
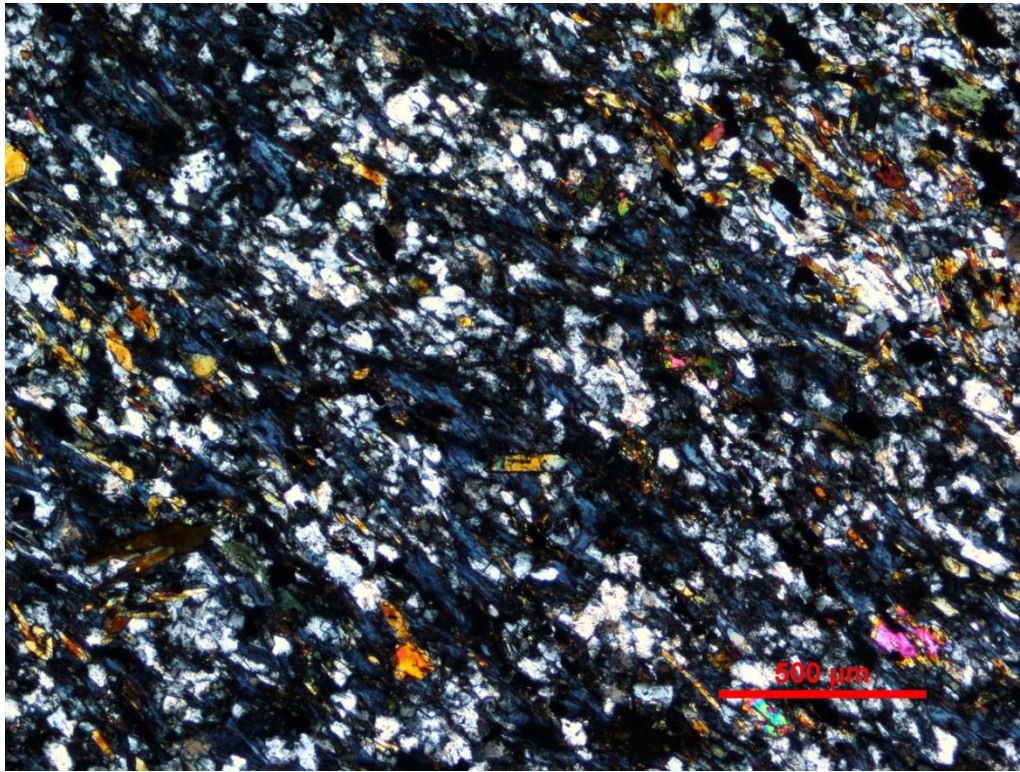
Sample CR-0031. Lineated amphibolite with albite twinning in plagioclase. Crossed polarizers.



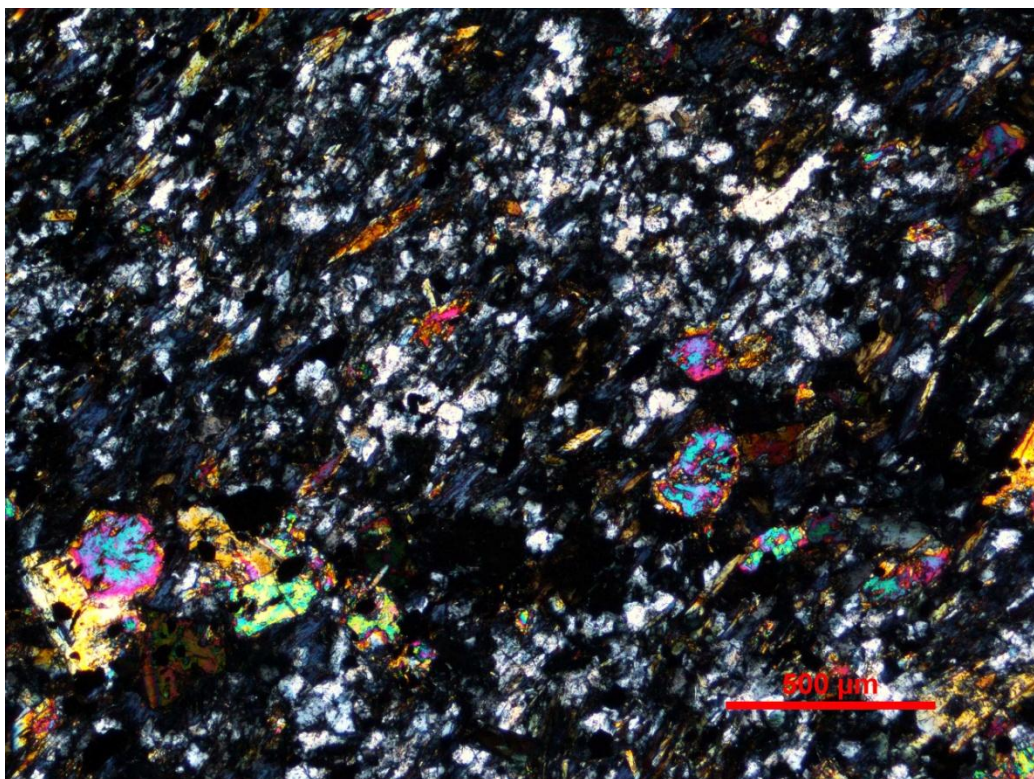
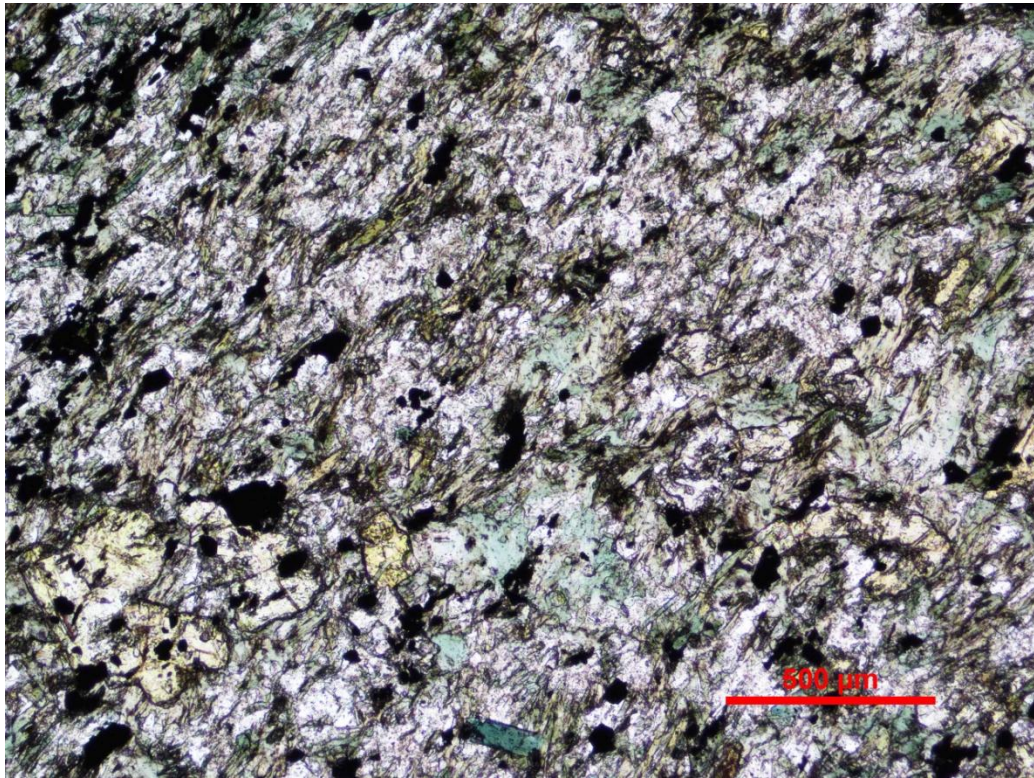


Sample CR-0031. Folded chlorite-epidote shear band interlayered with amphibolite. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.

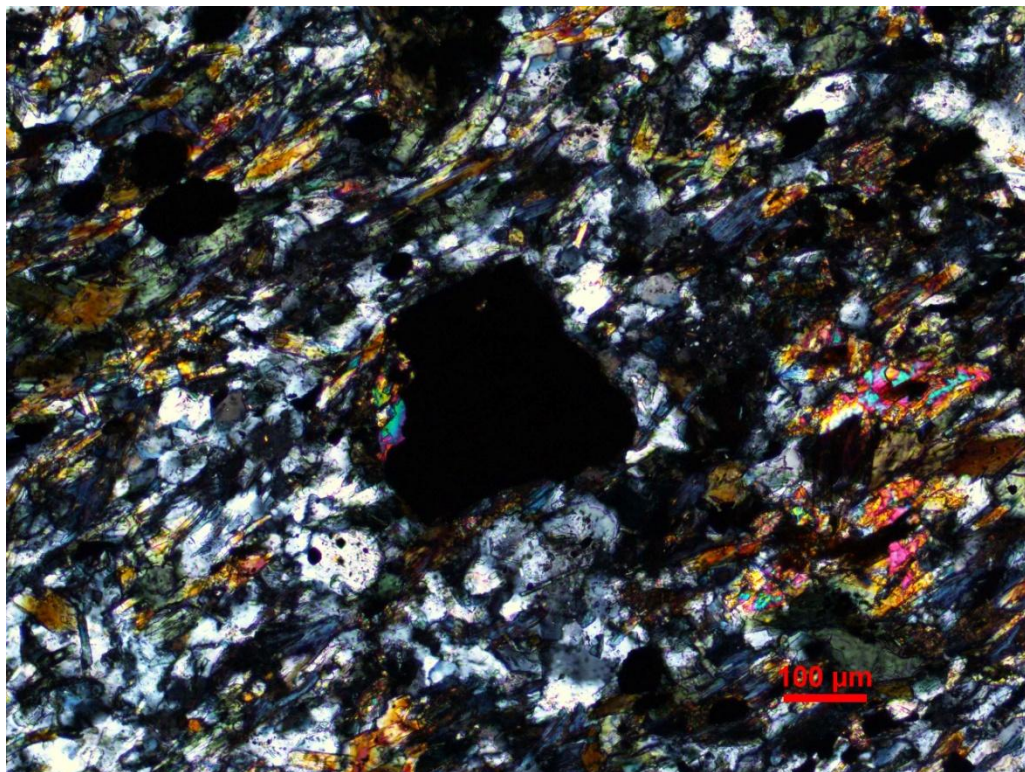
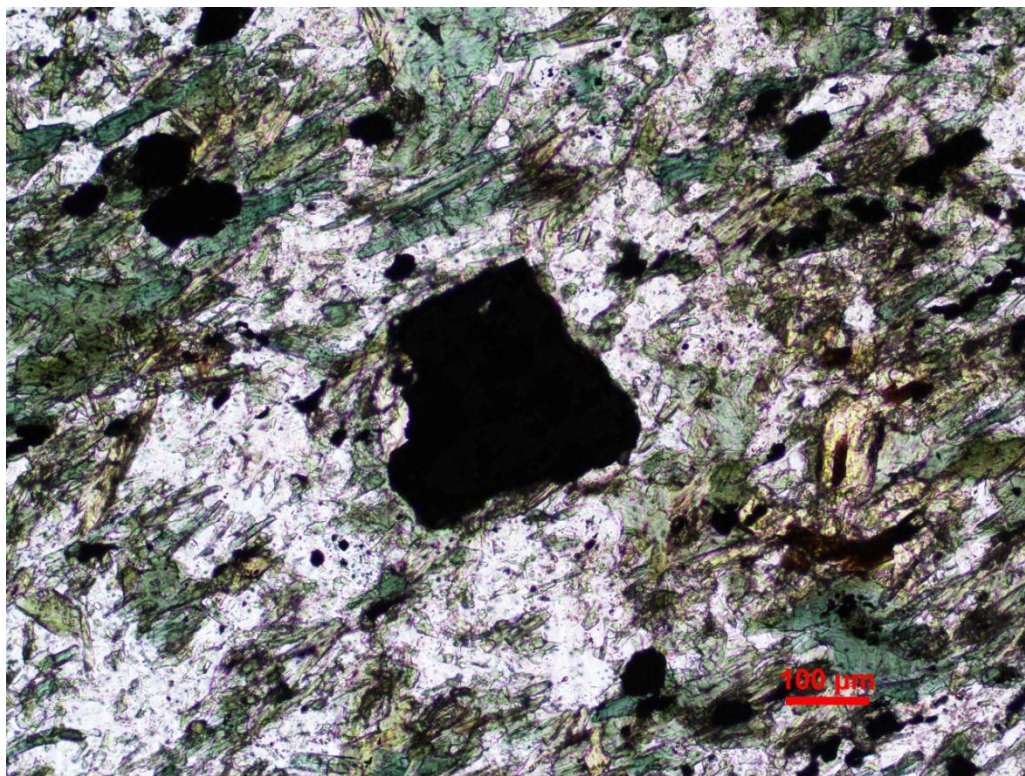


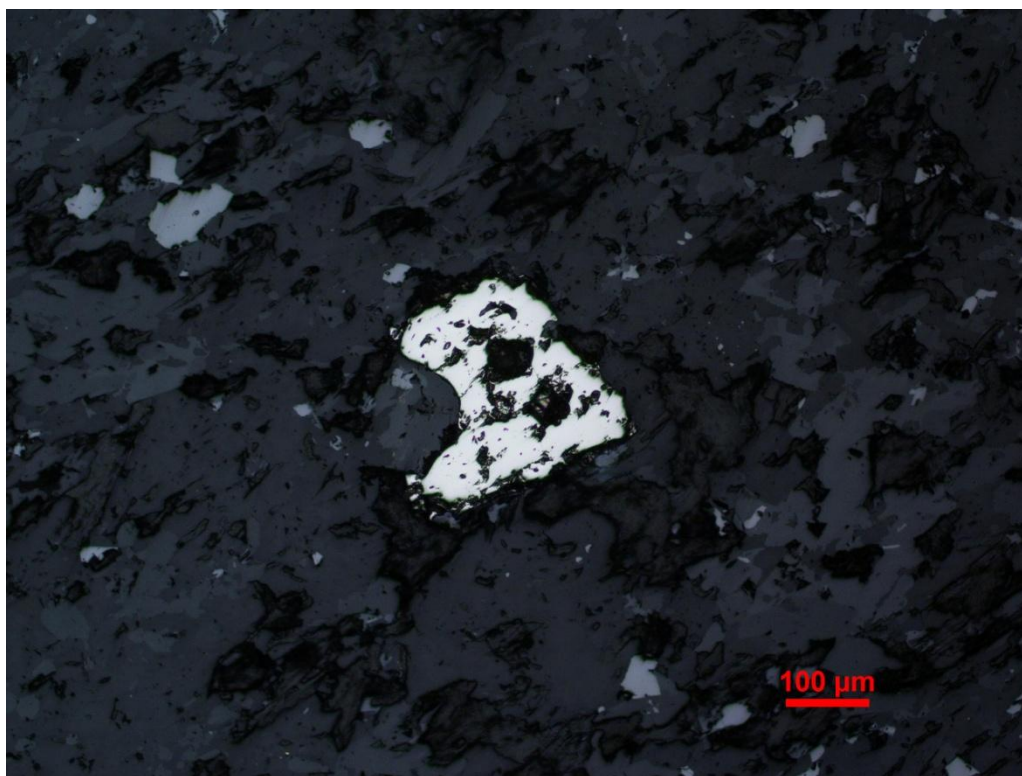


Sample CR-0031. Oriented chlorite in chlorite-epidote shear band. Chlorite has anomalous blue birefringence and low reflectivity. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.

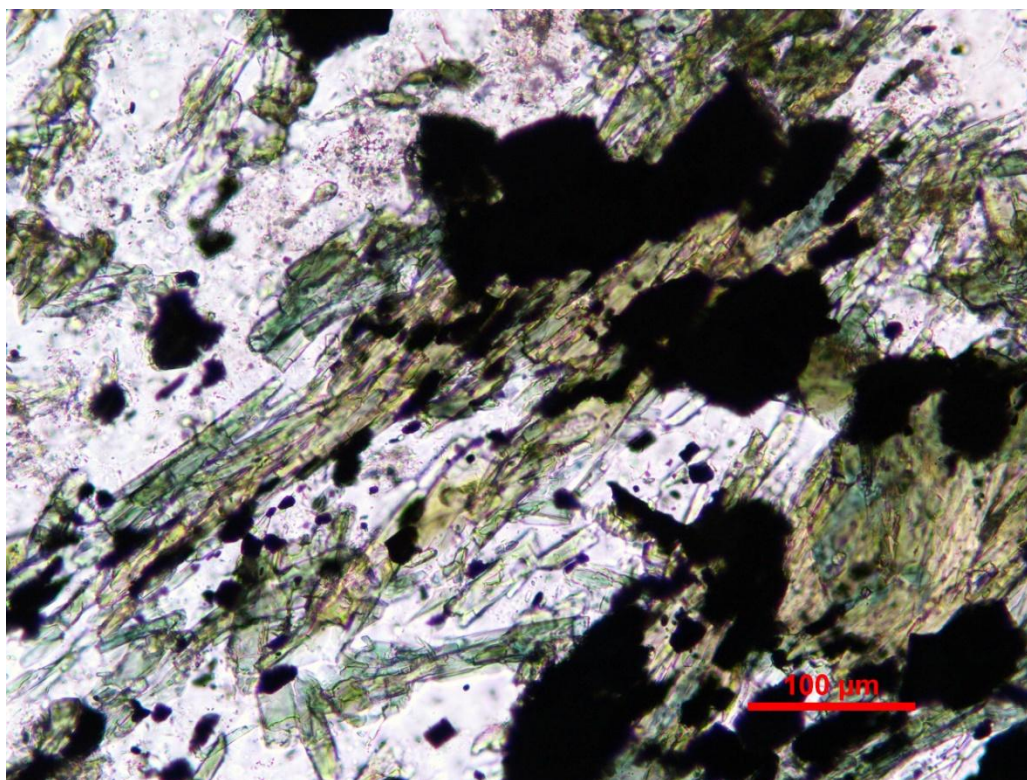


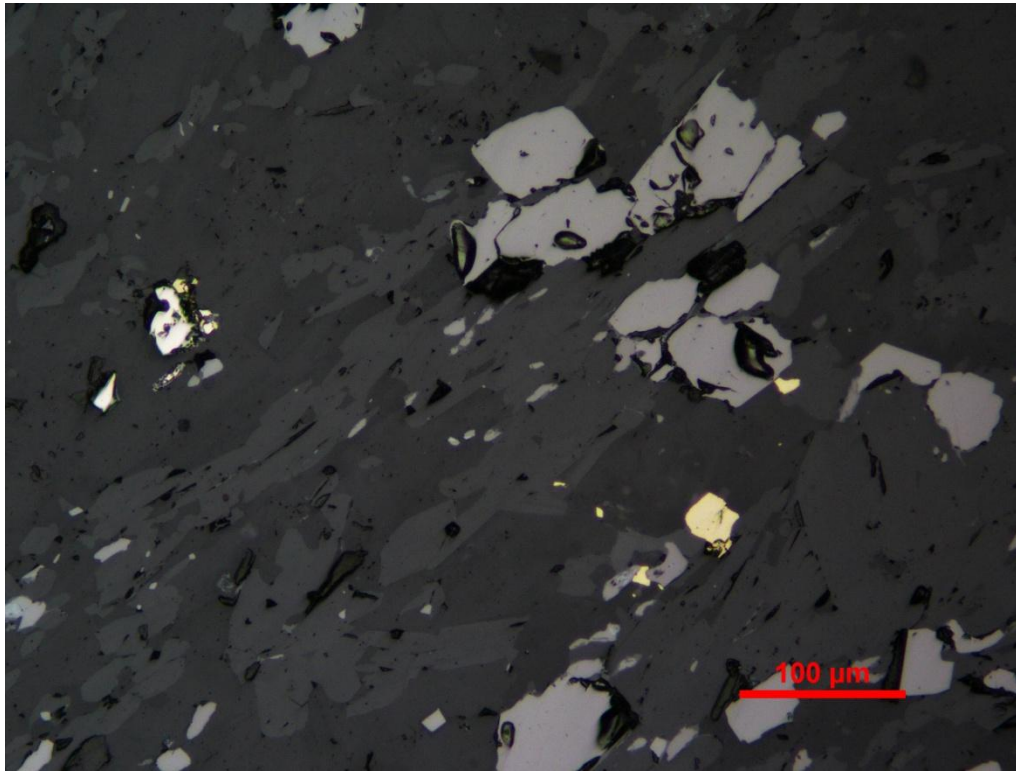
Sample CR-0031. Epidote microporphyroblasts in chlorite-epidote shear band. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.



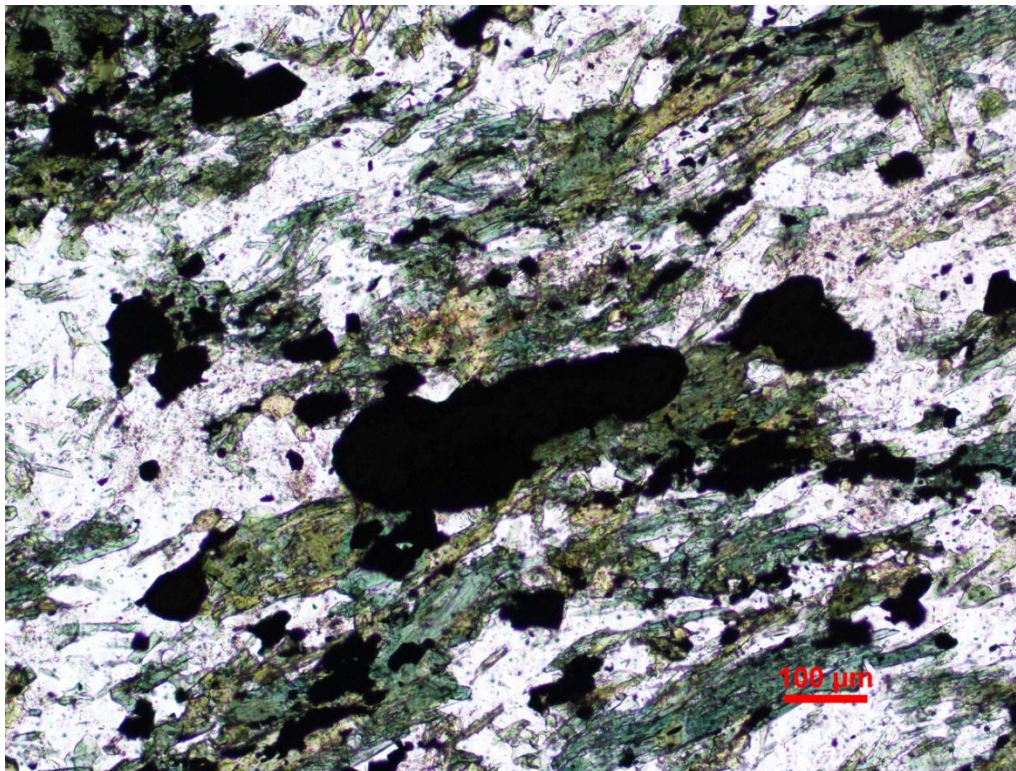


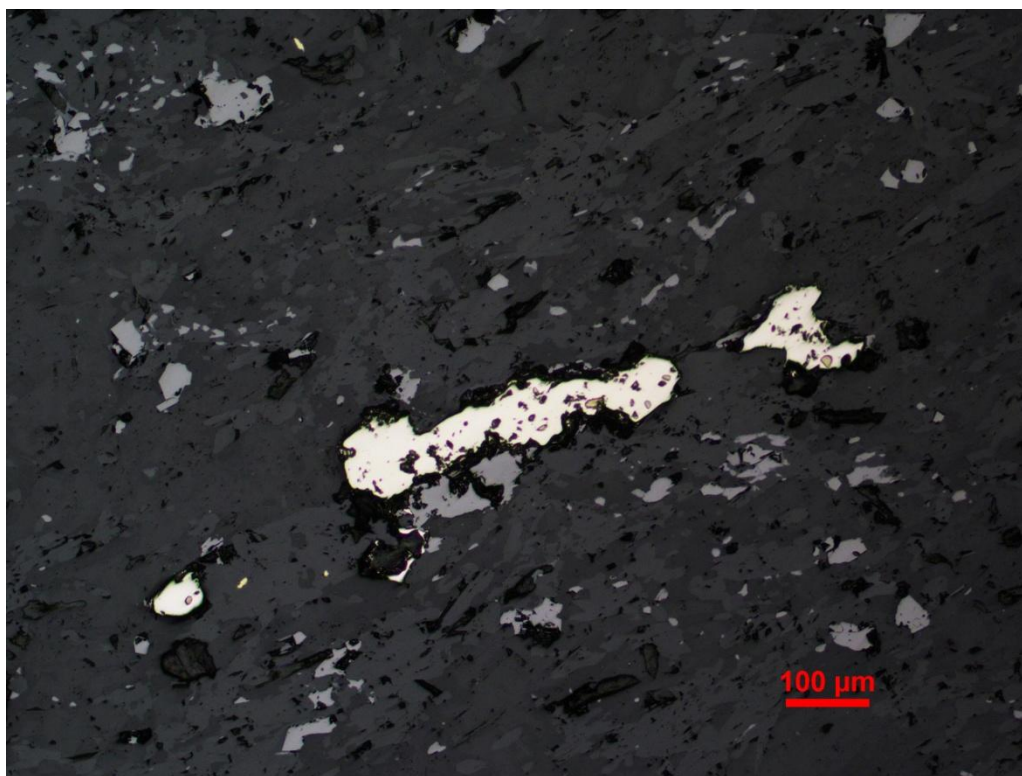
Sample CR-0031. Disseminated subhedral pyrite associated with epidote. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.



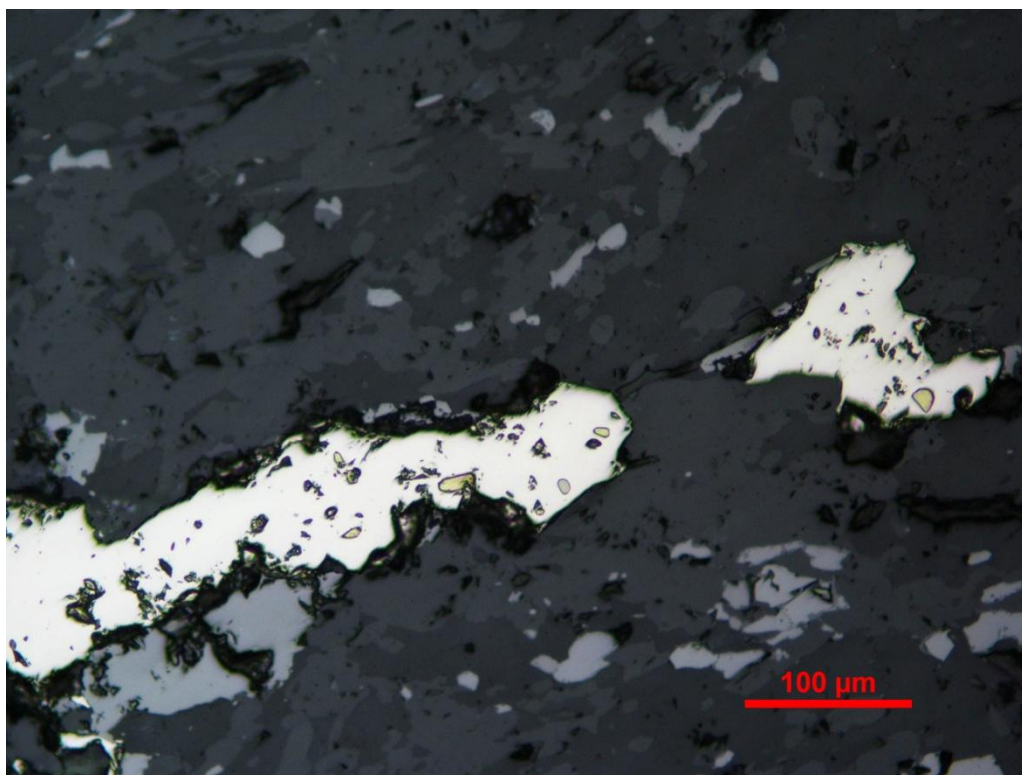


Sample CR-0031. Disseminated pyrite (left) and chalcopyrite (right) in amphibolite. Top- plane light; Bottom- reflected light.





Sample CR-0031. Disseminated pyrite-chalcopyrite in amphibolite. Top- plane light;
Bottom- reflected light.



Sample CR-0031. Enlarged from above, fine chalcopyrite inclusions (yellow) in
disseminated pyrite (whitish). Reflected light.