

PETROGRAPHIC REPORT

CLIENT: Trevor Burr, AngloGoldAshanti
PROJECT/PROPERTY: CR STUDY
SAMPLE NUMBER: CR-0030

BY: James R. Shannon, Ph.D.
SAMPLE TYPE: Polished Thin Section
DATE: 21-June 2017

HAND SAMPLE DESCRIPTION: Core sample from 15.85 m. Dark greenish black, fine to medium grained amphibolite/metagabbro. Very abundant actinolitic(?) amphibole intergrown with plagioclase. No preferred deformation fabrics (foliation/lineation) are evident. The sample is nonmagnetic with a pencil magnet and does not react to dilute HCl.

POLISHED-SECTION DESCRIPTION:

MINERAL	EST %	COMMENTS
PRIMARY	(18)	
Plagioclase	18	Subhedral to anhedral, elongated grains up to 1 mm; With twinning and minor normal zoning
METAMORPHIC	(80)	
Amphibole	76	Actinolitic amphibole has extensively replaced primary mafic phases
Epidote	0.5	Anhedral to subhedral grains up to 2.0 mm; distinct yellow-green-bluegreen pleochroism suggests actinolitic composition; similar oriented grains occur in 1 to 2 mm knots that probably represent outlines of original mafic phases; no evidence of pyroxene inclusions; many grains are dusted with very fine albite(?) inclusions
Ilmenite	2	Disseminated grains up to 0.1 mm; locally in clusters associated with disseminated chalcopyrite and pyrite
		Patches of tiny (0.05 mm) subhedral grains up to 0.5 mm; Probably replace primary opaque phase (titanomagnetite?)
ALTERATION	(0.2)	
Epidote	0.2	Very minor patchy epidote granules replace plagioclase
SULFIDE	(0.35)	
Pyrite	0.3	Minor disseminated sulfides associated with epidote
Chalcopyrite	0.05	Subhedral-anhedral grains up to 0.4 mm usually associated with disseminated epidote
		Anhedral grains up to 0.03 mm usually associated with disseminated epidote
VEINLETS	(1.5)	
Unknown	1	Irregular veinlets (0.05 to 0.3 mm thick) with unknown and calcite
Calcite	0.5	Colorless, low relief, biaxial (+) 2V 70; wavy extinction; optics similar to prehnite

TEXTURES

The sample displays a very fine to medium grained relict gabbroic texture with abundant metamorphic actinolitic amphibole and relict plagioclase laths. All original mafic phases have been replaced by actinolitic amphibole. There is no evidence of olivine, pyroxenes, magmatic

hornblende, or biotite. Actinolitic amphibole with distinct yellow-green-bluegreen pleochroism occurs in knots up to 1 to 2 mm, with similar optical orientation. These knots may represent the size of original mafic grains. The core zones of many amphibole grains have clouds of tiny albite(?) inclusions. The actinolitic amphibole is intergrown with and locally replaces subhedral plagioclase laths, interpreted to be relicts of original plagioclase grains. The sample does not have preferred deformation or metamorphic fabrics (foliations and/or lineations). There is no evidence of a late magmatic hydrous assemblage in this sample; probably destroyed by metamorphic overprint.

The original accessory suite has been destroyed by metamorphic overprinting. Very fine subhedral ilmenite occurs in dense clusters that outline probable original opaque grains (possibly titanomagnetite).

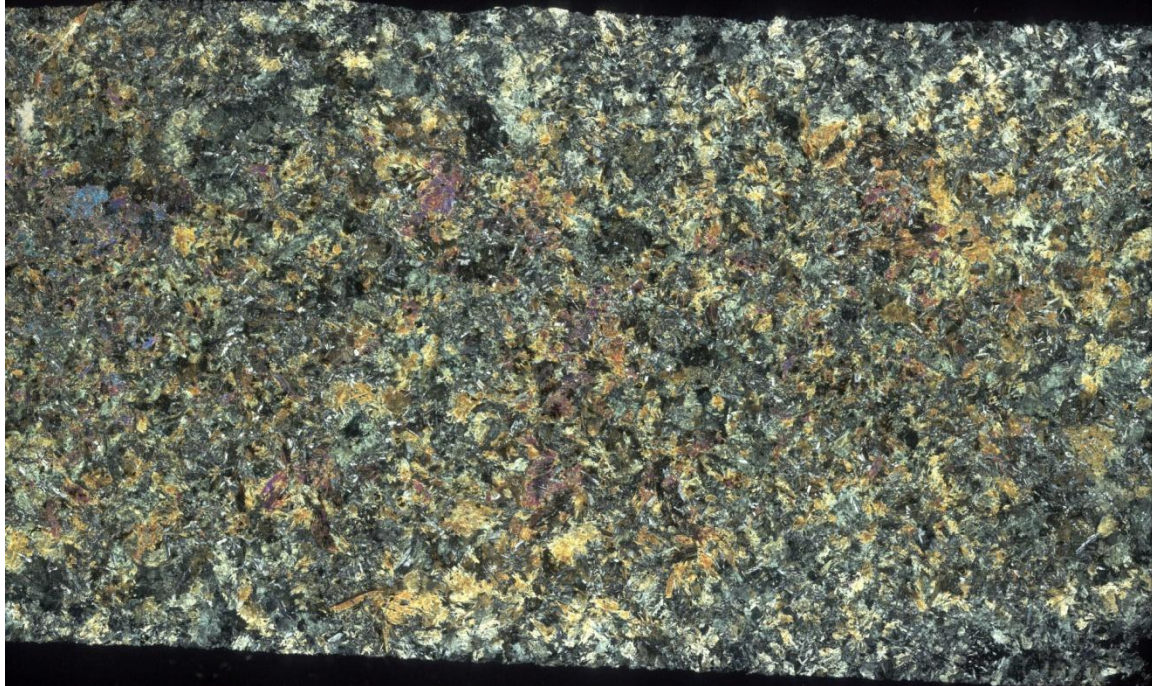
The sample has minor disseminated epidote that is spatially associated with disseminated pyrite and chalcopyrite. The sulfides are simple grains and do not have magmatic sulfide character (composite sulfides with blebby shapes occurring in primary silicates). The disseminated epidote is probably related to metamorphic overprinting, at which time sulfides were introduced or remobilized from the protolith.

METAMORPHIC OVERPRINT

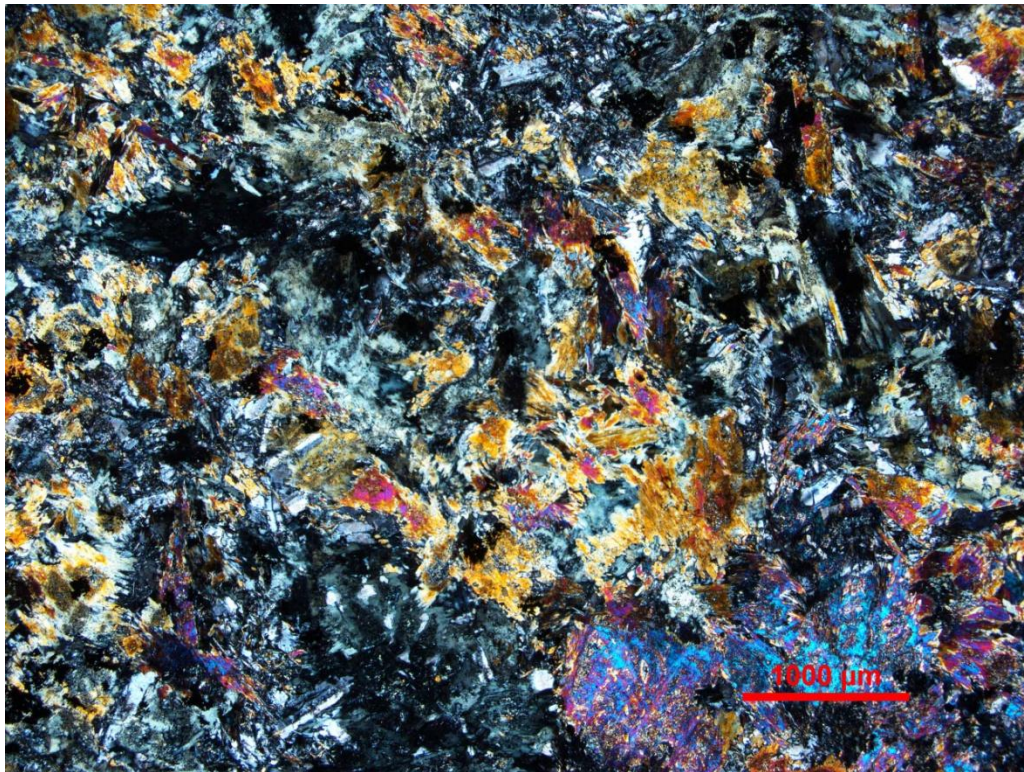
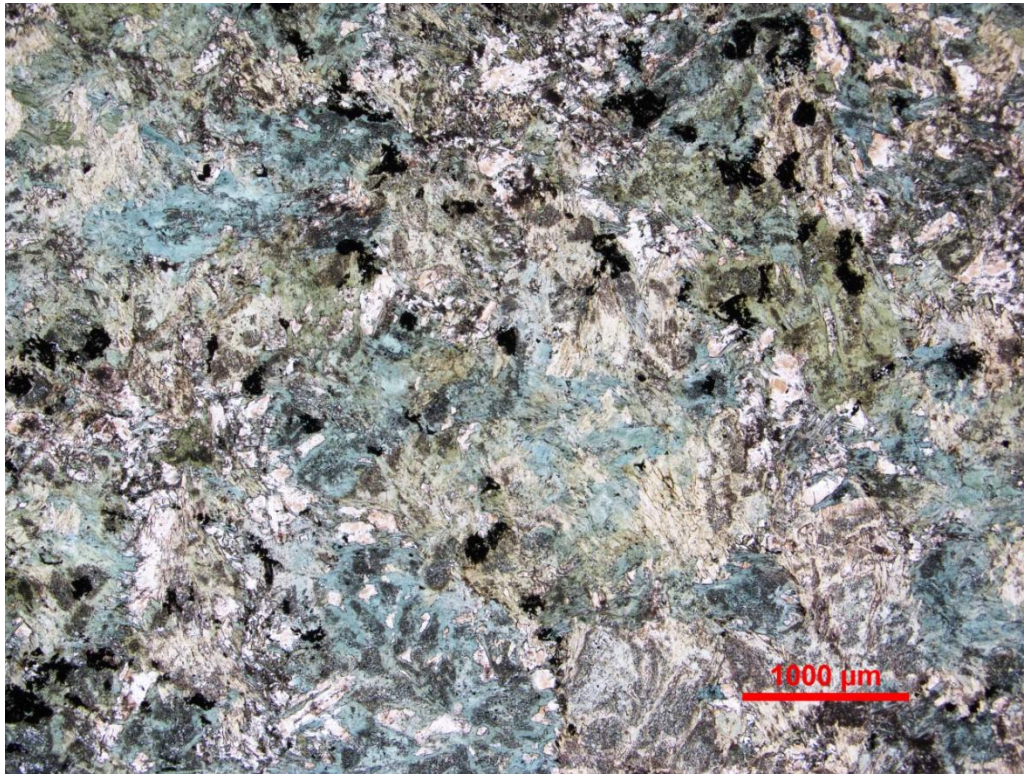
The sample has a strong metamorphic overprint with complete recrystallization of original mafic phases and replacement by green-bluegreen actinolitic amphibole. Minor disseminated epidote is stable with actinolite. The metamorphic overprint was mainly a medium grade thermal metamorphism equivalent to amphibolites facies.

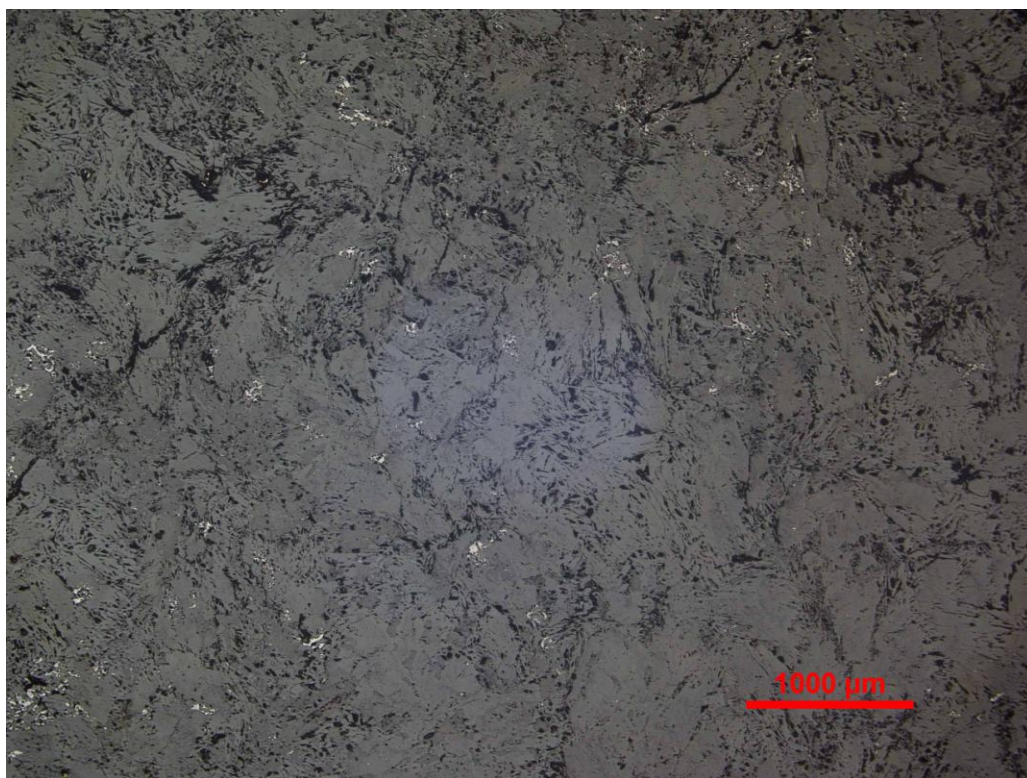
ROCK NAME: Amphibolite-Metagabbro

PROTOLITH: Mafic-Rich Gabbroic Rock (of mafic/ultramafic composition)

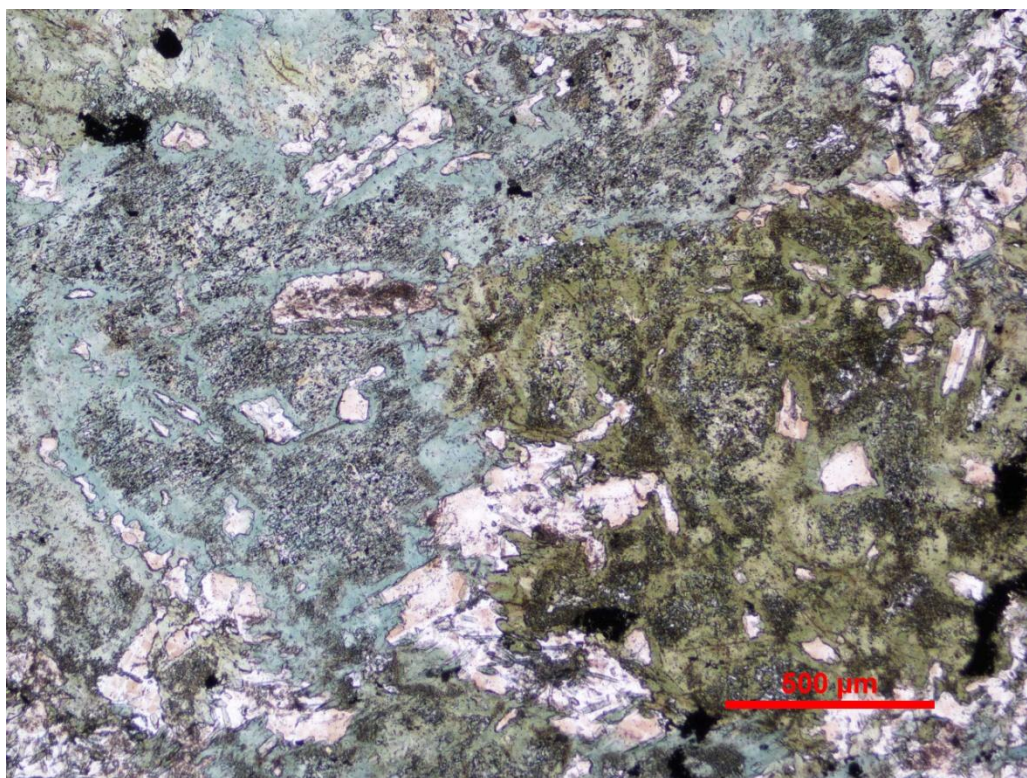


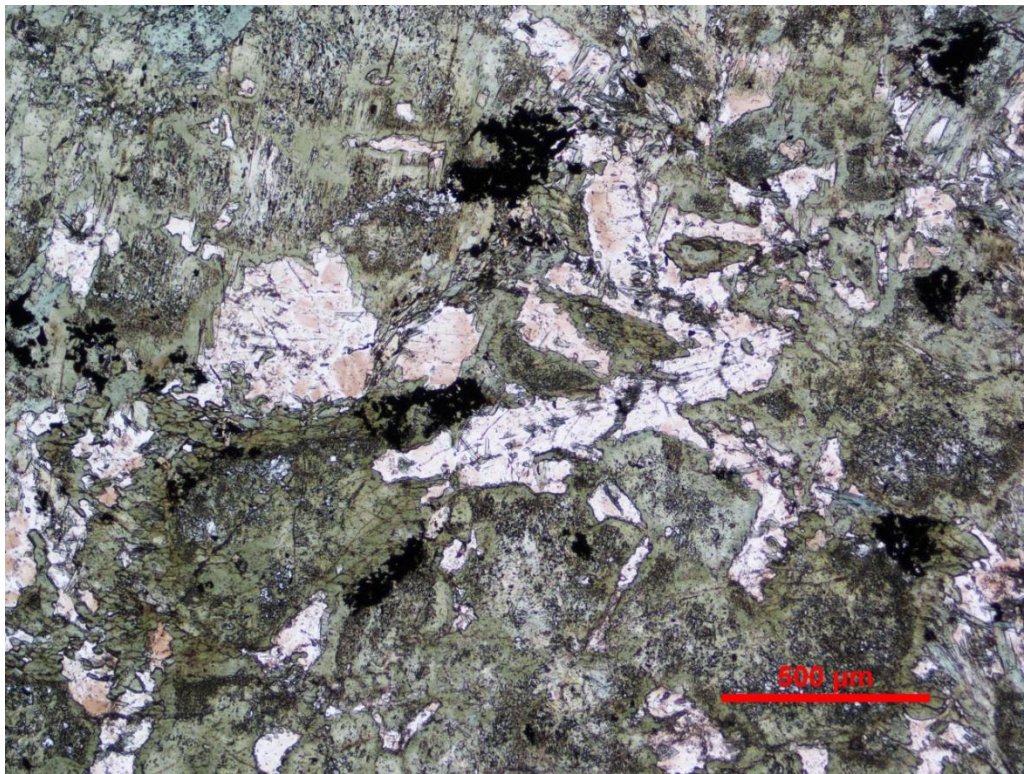
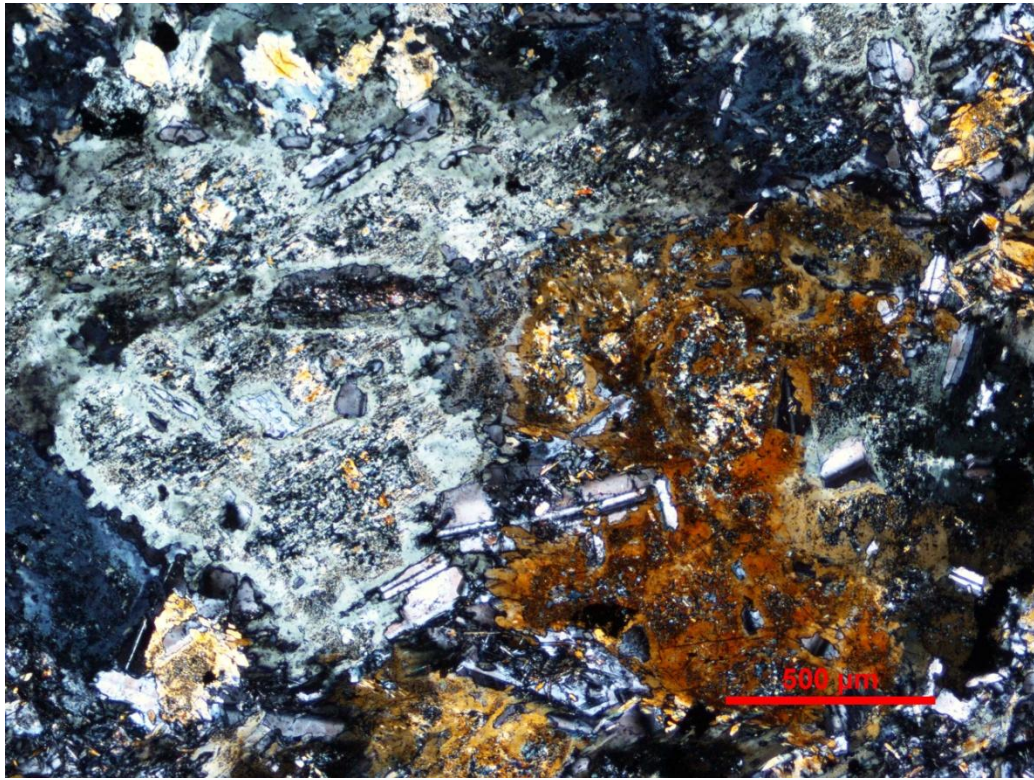
Sample CR-0030. Wide-field, full-thinsection view showing very amphibole rich metagabbro. Note the lack of preferred deformation fabrics (foliations and lineations). Top- plane light; Bottom- crossed polarizers.

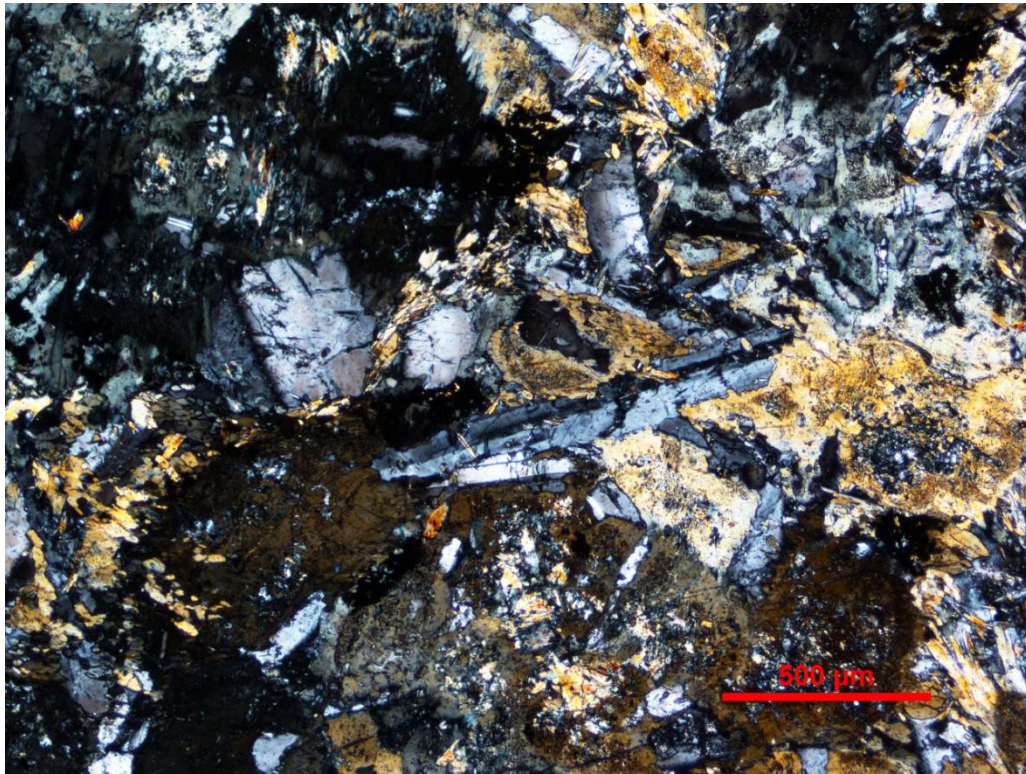




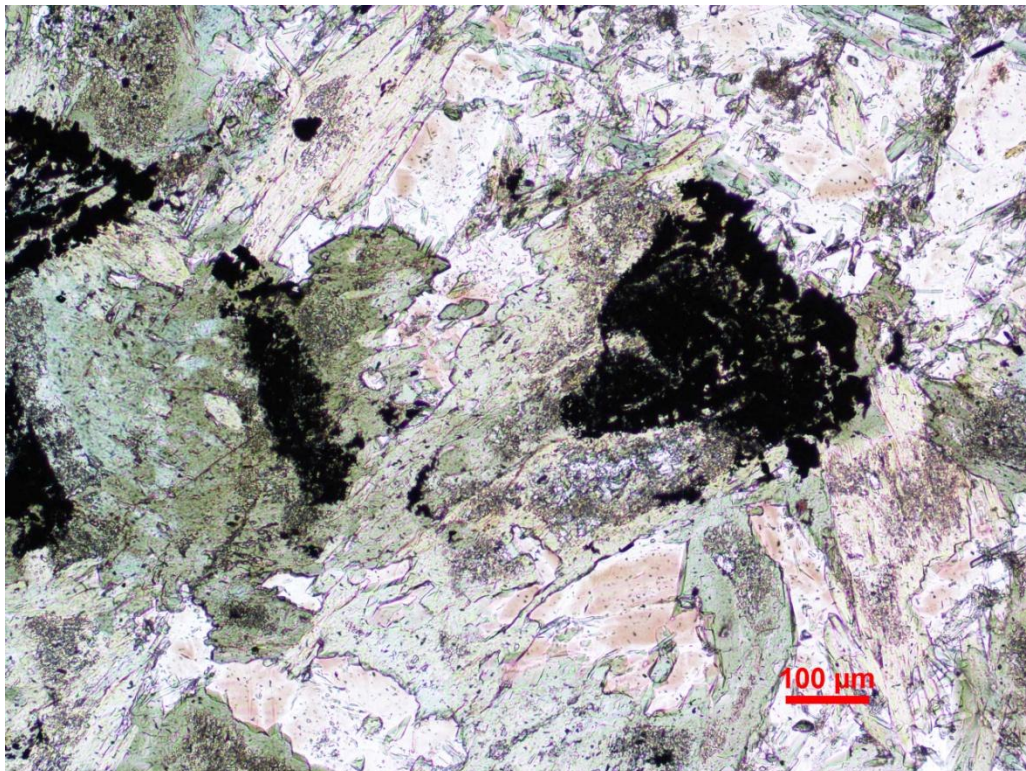
Sample CR-0030. Metagabbro with primary mafics replaced by green-bluegreen actinolitic amphibole and relict plagioclase laths. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.

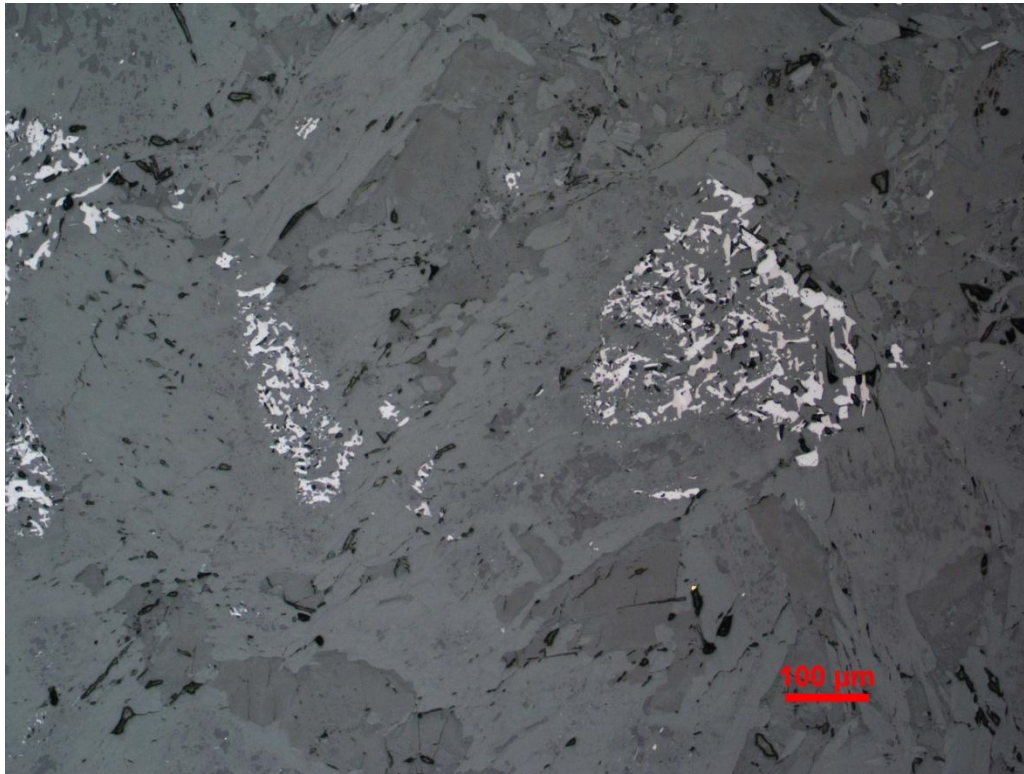




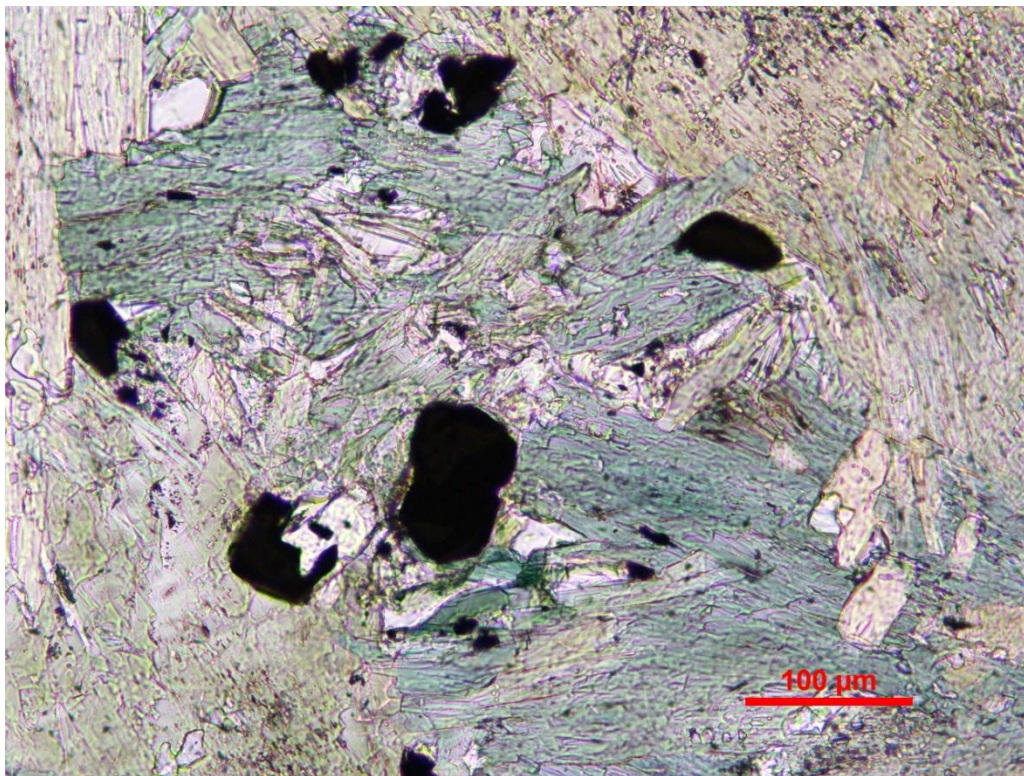


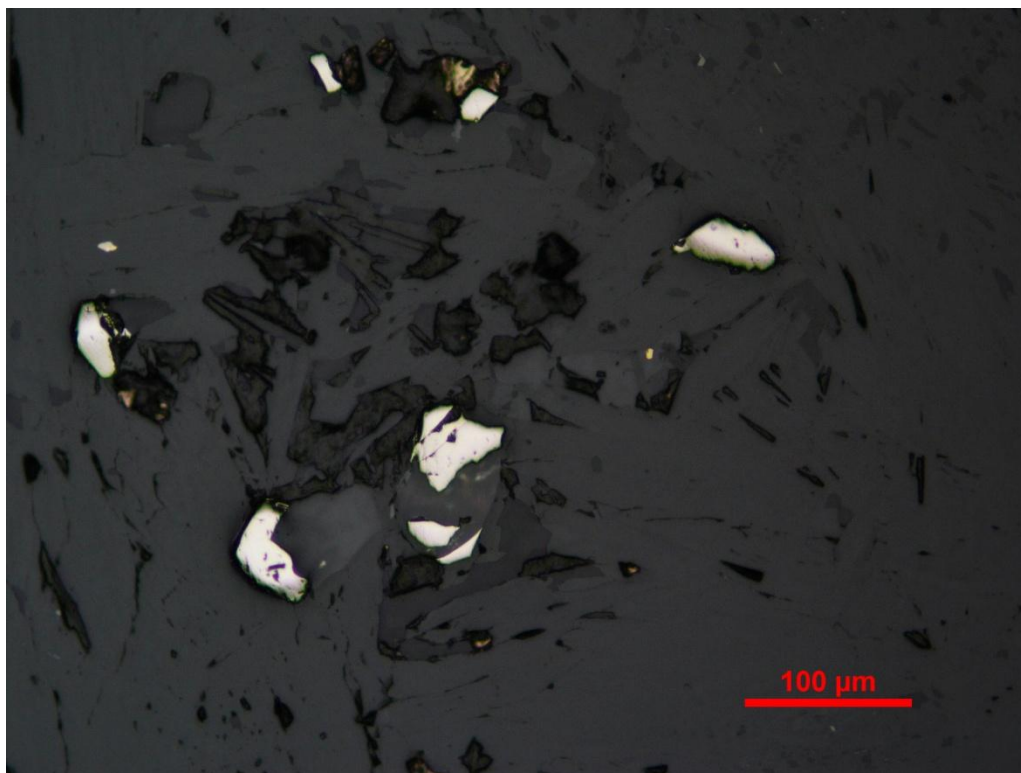
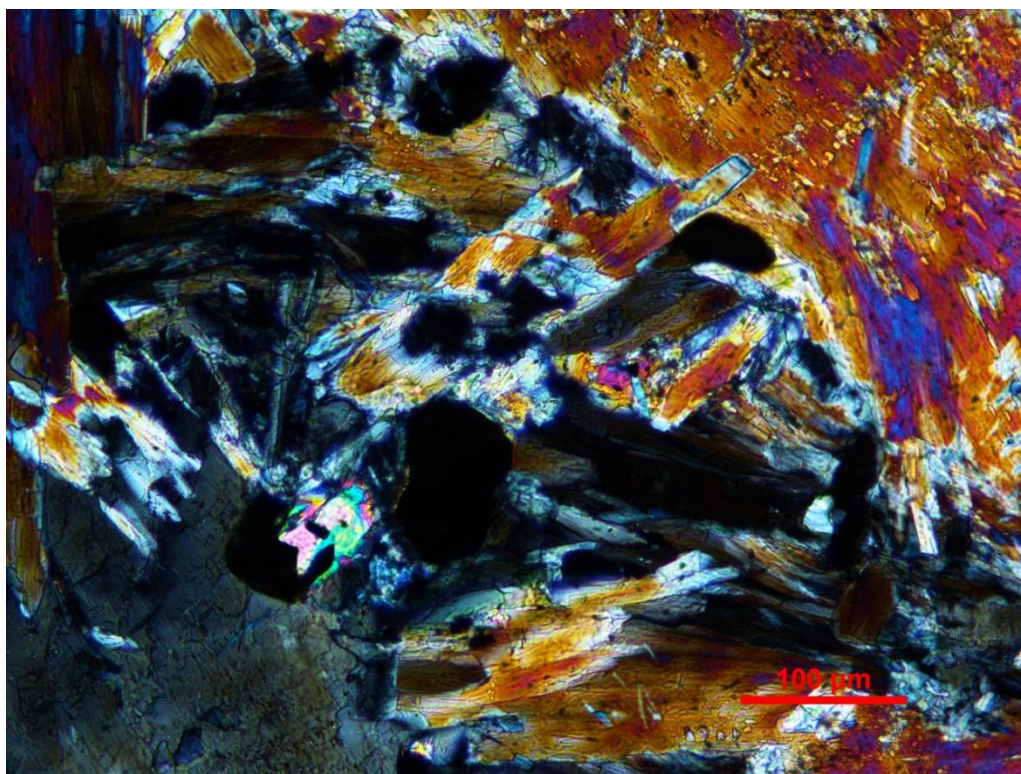
Sample CR-0030. Relict subhedral, elongated plagioclase laths with twinning and minor normal zoning. Metamorphic amphiboles locally replace plagioclase. Note peculiar brownish coloration (top). Top- plane light; Bottom- crossed polarizers.



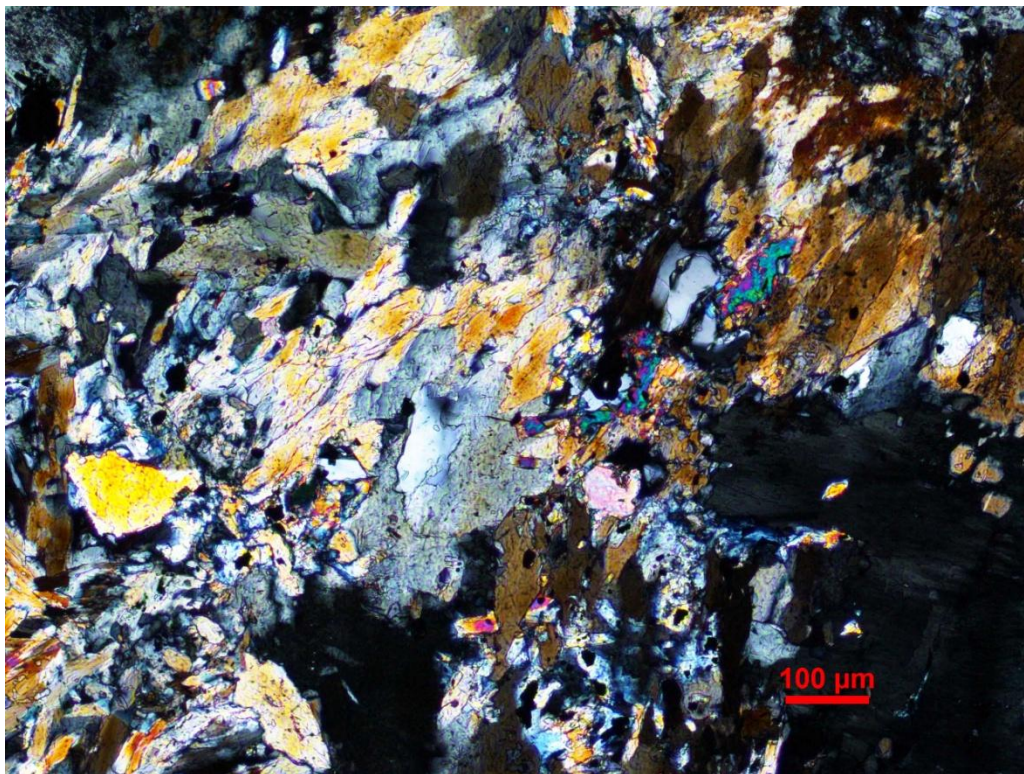
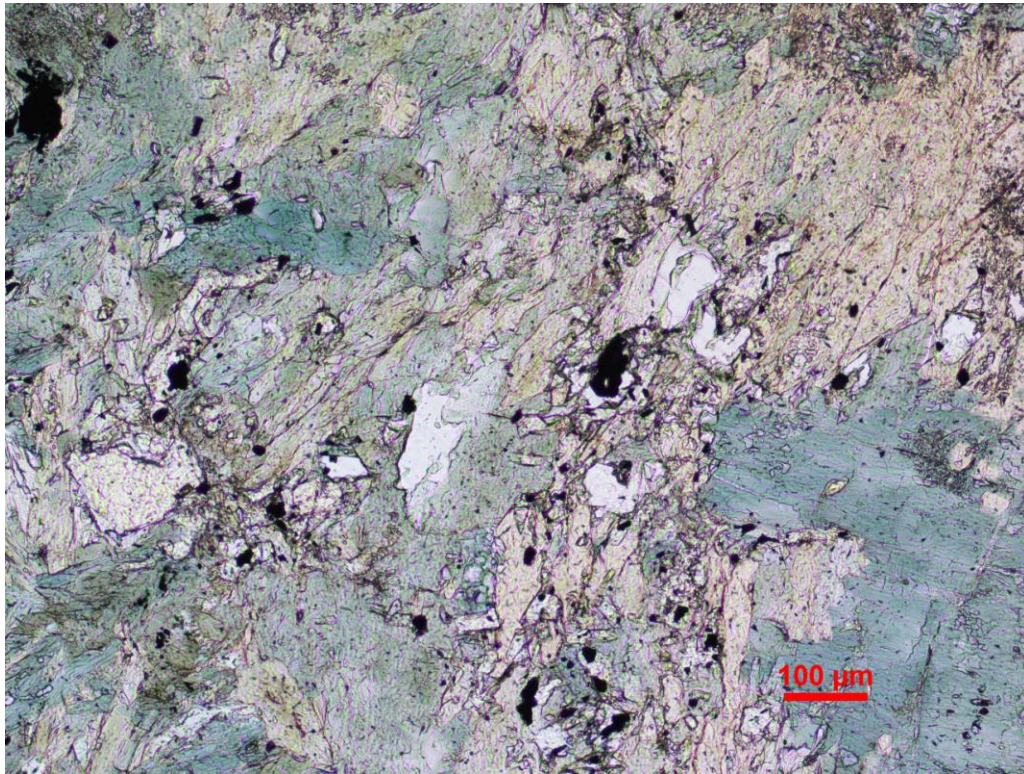


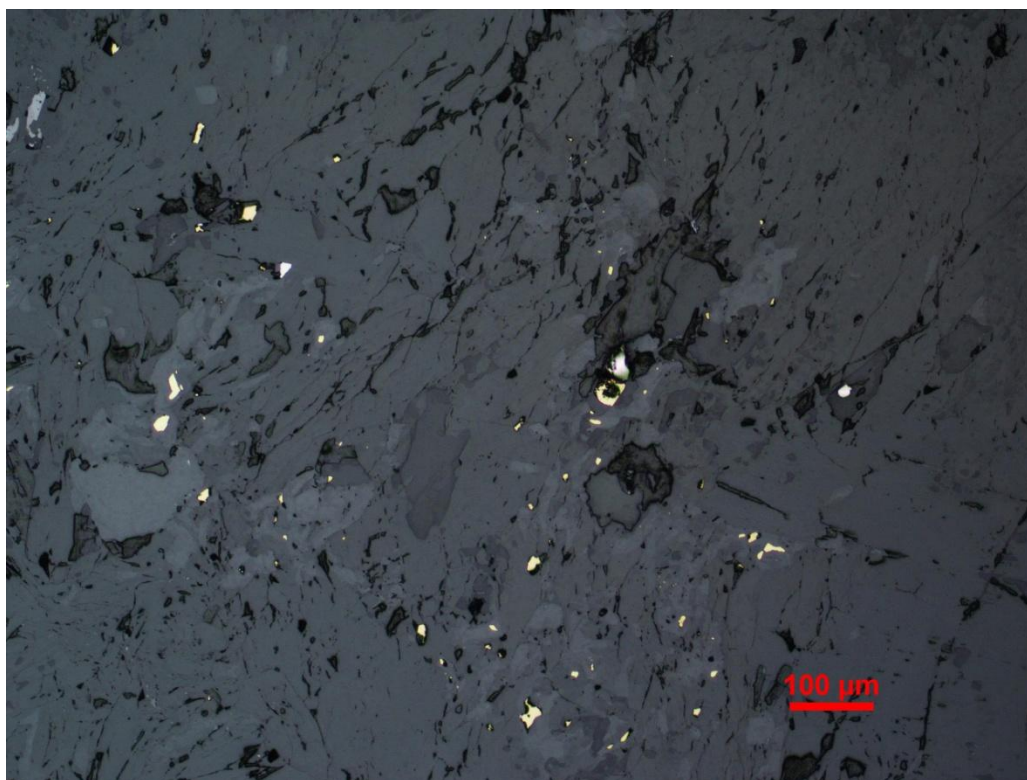
Sample CR-0030. Clusters of fine subhedral ilmenite crystals probably outlining primary Ti-rich opaque phase (titanomagnetite?). Top- plane light; Bottom- reflected light.



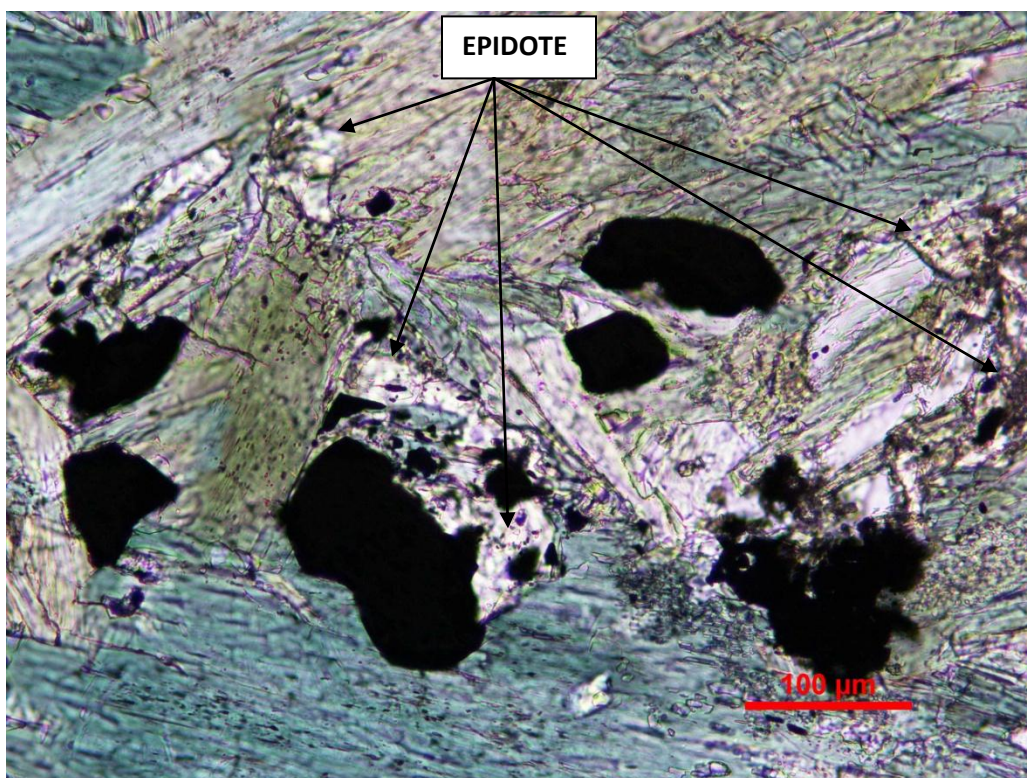


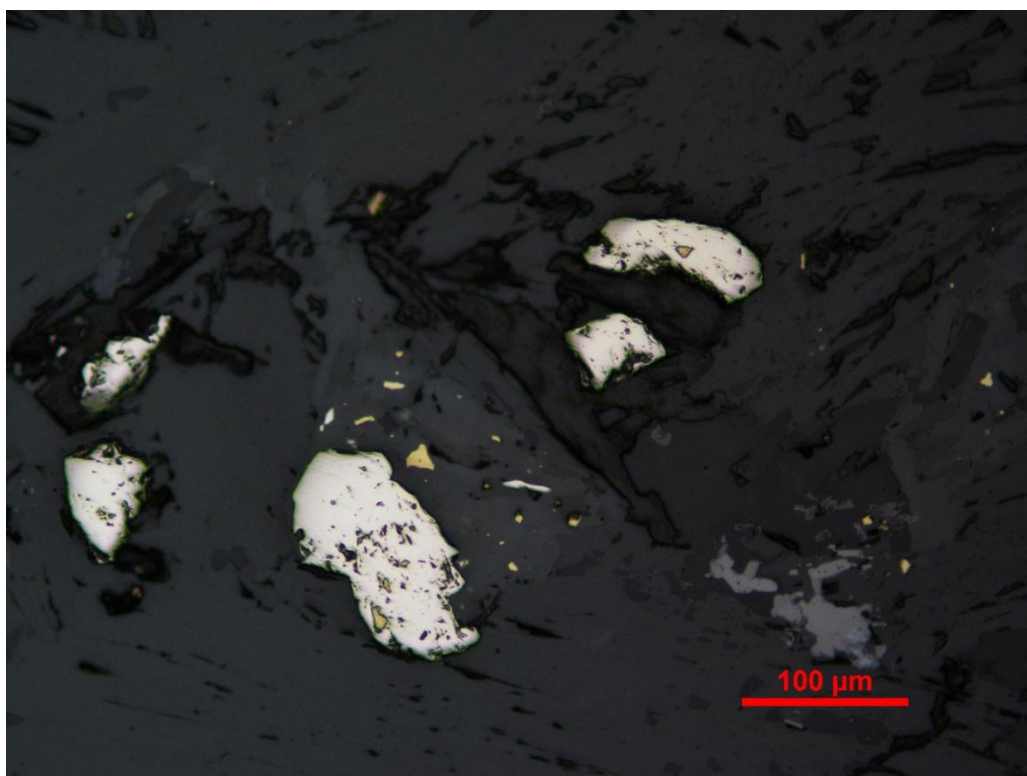
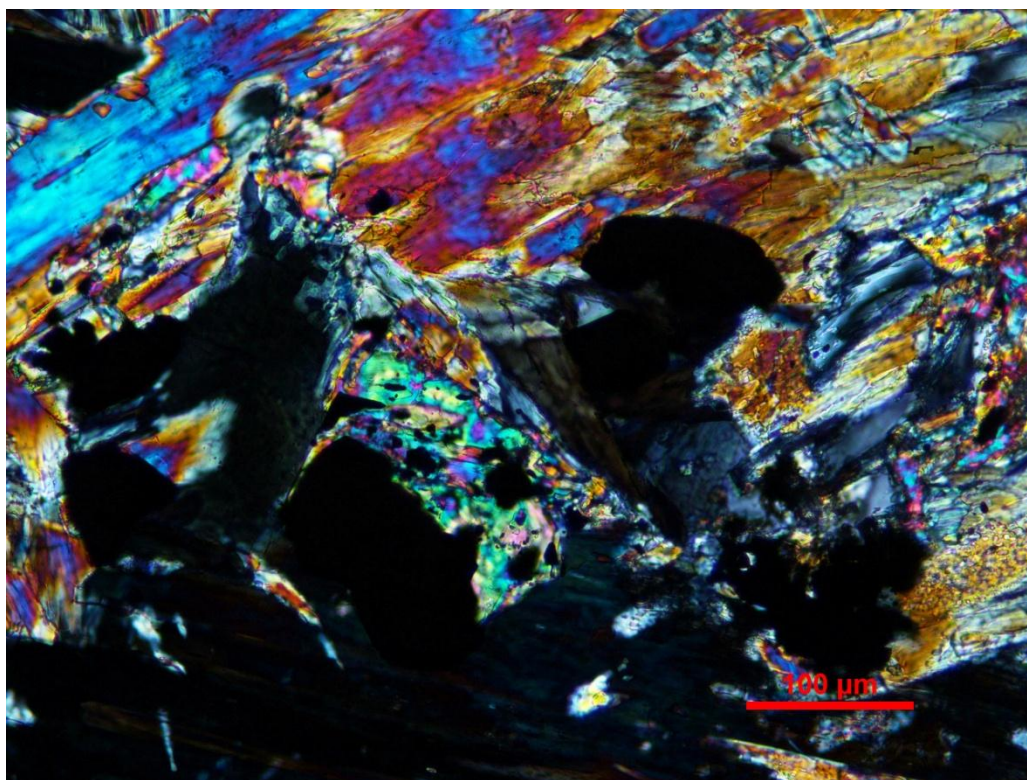
Sample CR-0030. Disseminated anhedrally pyrite associated with epidote. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.





Sample CR-0030. Fine disseminated chalcopyrite and epidote in metamorphic amphibole. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.





Sample CR-0030. Disseminated pyrite (whitish) and chalcopyrite (yellow) associated with disseminated epidote. Note chalcopyrite inclusions in epidote. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.