

PETROGRAPHIC REPORT

CLIENT: Trevor Burr, AngloGoldAshanti
PROJECT/PROPERTY: CR STUDY
SAMPLE NUMBER: CR-0026

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

HAND SAMPLE DESCRIPTION: Core from 43.6 m shows Dark gray very fine grained phyllitic mylonite with moderate lineation and weak foliation. There is a suggestion of incipient gneissic banding with quartz-feldspar lenses paralleling lineation/foliation. The rock is nonmagnetic and there is no reaction from dilute HCl.

POLISHED-SECTION DESCRIPTION:

MINERAL	EST %	COMMENTS
METAMORPHIC		
PORPHYROBLAST	[3]	Minor amphibole porphyroblasts
Amphibole	3	Subhedral microporphyroblasts up to 0.5 mm
MATRIX	[82]	Mylonitic-ultramylonitic amphibole rich, strongly lineated matrix
Amphibole	67	Subhedral, elongated grains up to 1 mm intergrown with small, flat quartz-plagioclase lenses and disseminated ilmenite
Quartz	5	Very fine grained recrystallized, mosaics intergrown with feldspar and flattened parallel to amphibole lineation
Feldspar	10	Very fine grained recrystallized mosaics (anhedral plagioclase) intergrown with quartz and flattened parallel to amphibole lineation
Epidote	0.1	Minor disseminated, anhedral-subhedral grains up to 0.08 mm locally associated with disseminated pyrite and chalcopyrite
Chlorite	2	Minor irregular patches and bands; Appears to locally replace amphibole
ACCESSORY	[3]	
Ilmenite	3	Subhedral elongated grains up to 0.1 mm; Elongated parallel to amphibole lineation; Depleted in quartz-feldspar segregations
QTZ-PLAG LENS	[15.5]	Irregular, discontinuous bands and lenses interlayered with mylonitic amphibolite; Metamorphic segregation banding; Anhedral intergrowth of quartz, plagioclase, amphibole and chlorite
Quartz	14	Anhedral quartz grains up to 0.3 mm intergrown with plagioclase, amphibole and chlorite
Plagioclase	1.5	Anhedral grains up to 0.5 mm; minor relict albite twinning
SULFIDES	[0.15]	
Pyrite	0.1	Anhedral grains up to 0.3 mm; Locally elongated parallel to amphibole lineation; Associated with chlorite, epidote and Cpy
Chalcopyrite	0.05	Fine anhedral-subhedral disseminated grains up to 0.12 mm; Associated with disseminated epidote and pyrite
Arsenopyrite?	Tr	Whitish phase associated with chalcopyrite; One 0.02 mm

		grain
VEINLETS	[0.5]	Irregular set hairline chlorite microveinlets; perpendicular to amphibole lineation
Chlorite	0.5	

TEXTURES

The sample displays a very fine to fine grained, incipient gneissic amphibolite texture with a strong penetrative lineation fabric. Abundant green-bluegreen actinolitic amphibole is intergrown with quartz, feldspar, and ilmenite. The quartz and feldspar are recrystallized into thin, discontinuous bands and elongated lenses. The textures suggest the quartz and feldspar were grain-size reduced during mylonitic deformation. The strongly lineated amphibolite lacks evidence of S-C mylonitic deformation fabrics. The textures are suggestive of a ultramylonitic fabric.

A weak gneissic banding is imparted by discontinuous quartz-feldspar-amphibole bands and lenses that parallel the amphibole lineation. There are suggestions of C-S mylonitic deformation fabrics in these segregations.

There appears to be a weak chlorite overprint. Irregular chlorite bands and patches cut the ultramylonitic amphibolite. Some chlorite replaces amphibole in and along the quartz-feldspar-actinolite segregations. Minor chlorite occurs in a set of hairline microveinlets that are normal to mylonitic and lineation fabrics.

The rock is weakly mineralized with minor disseminated pyrite and chalcopyrite, and trace arsenopyrite(?). The sulfides are locally associated with epidote and chlorite.

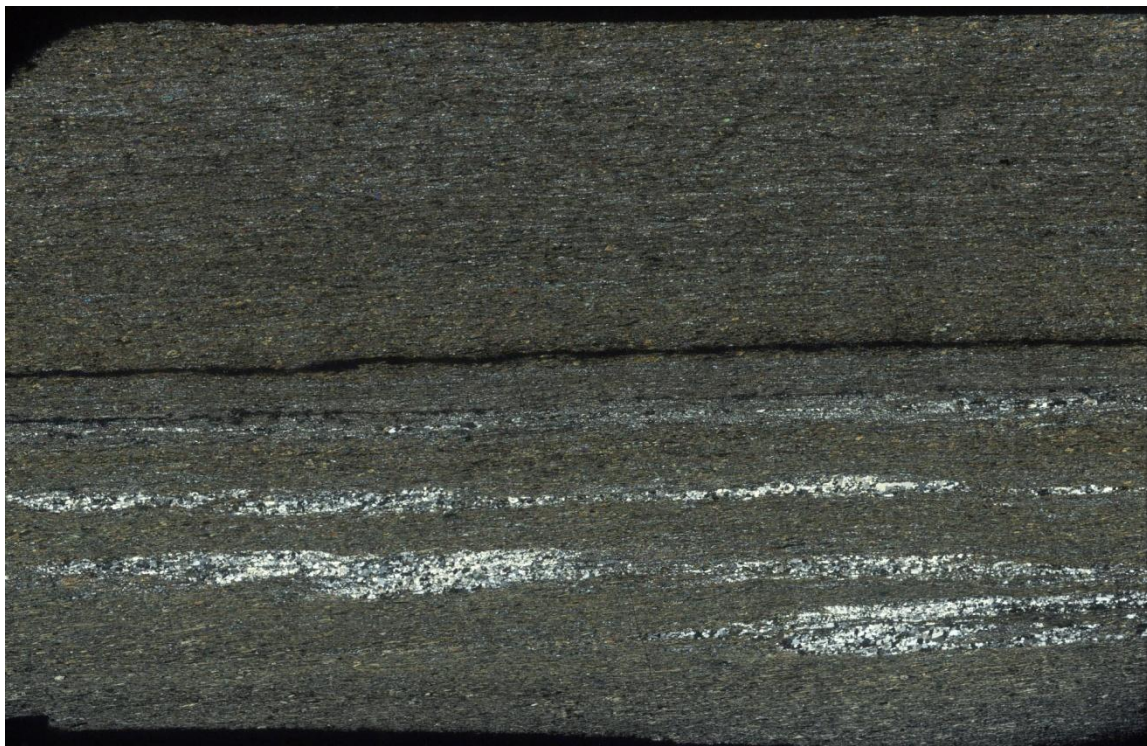
METAMORPHISM

The main actinolite-quartz-plagioclase assemblage indicates a medium grade of metamorphism equivalent to amphibolite facies. Strong recrystallization under dynamic conditions resulted in development of penetrative ultramylonitic fabrics with minor S-C mylonitic fabrics. Elongated actinolitic(?) amphibole is strongly lineated. Recrystallized quartz and feldspar lenses and bands of chlorite impart a component of foliation to the fabric which is visible in hand sample.

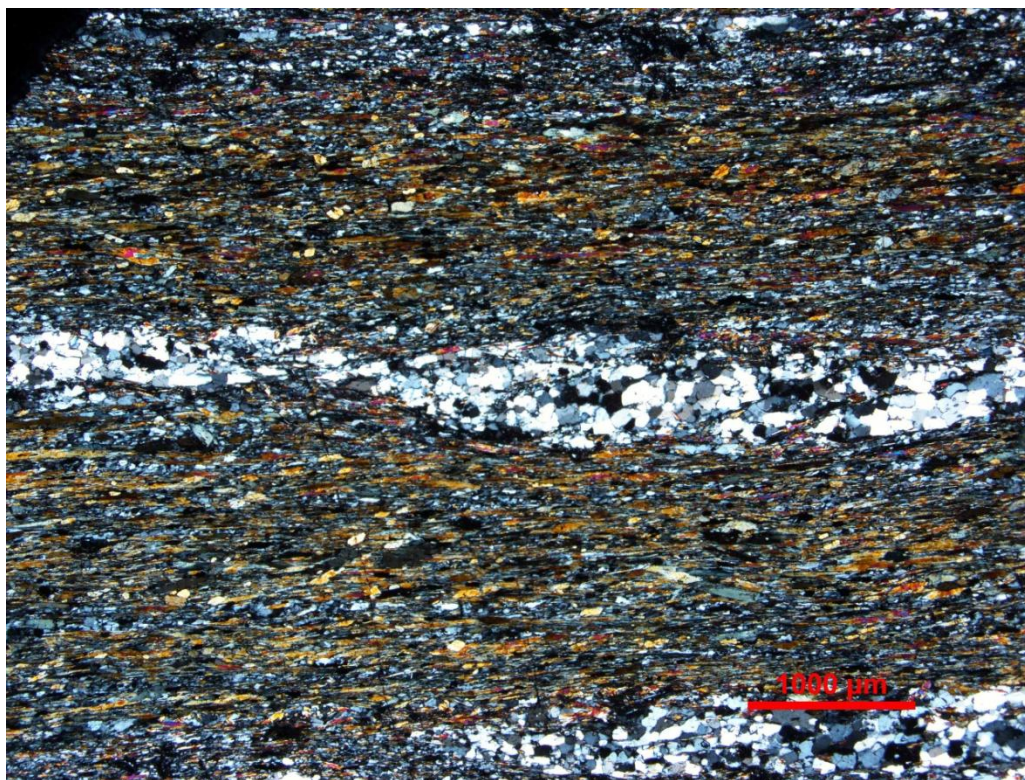
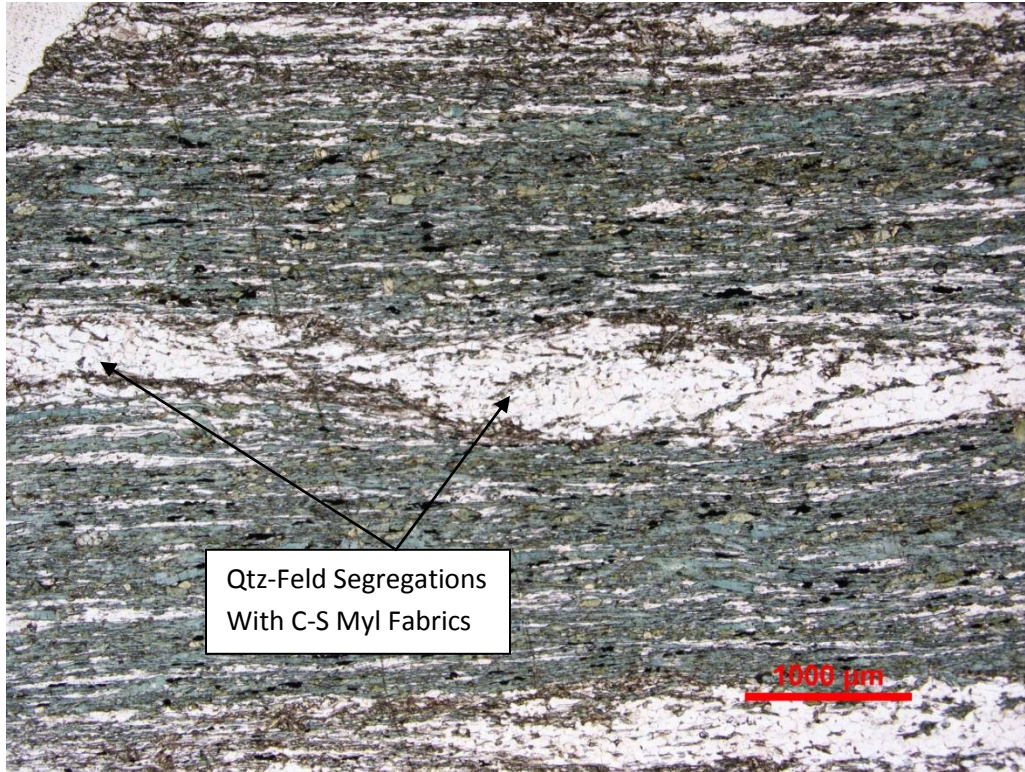
The disseminated epidote and sulfides appear to be associated with chlorite. The chlorite-epidote-sulfide assemblage may be a retrograde, or weaker later metamorphic event.

ROCK NAME: Gneissic, Mylonitic Actinolite Amphibolite

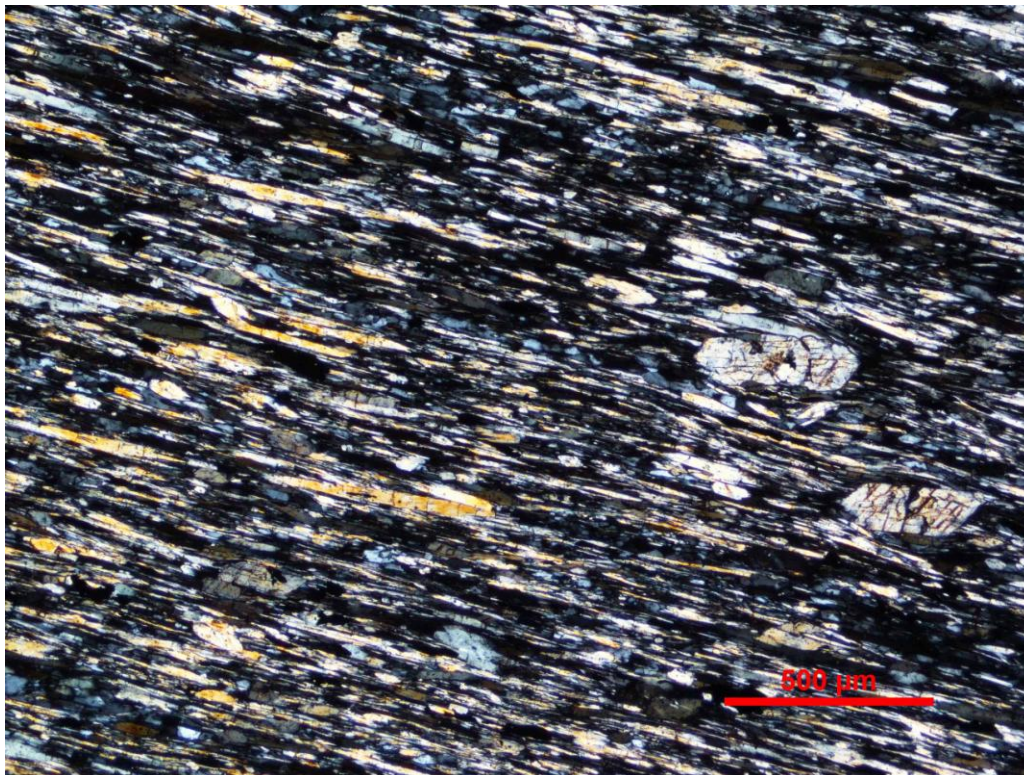
PROTOLITH: Uncertain protolith; Mafic composition (Possible Basaltic?)



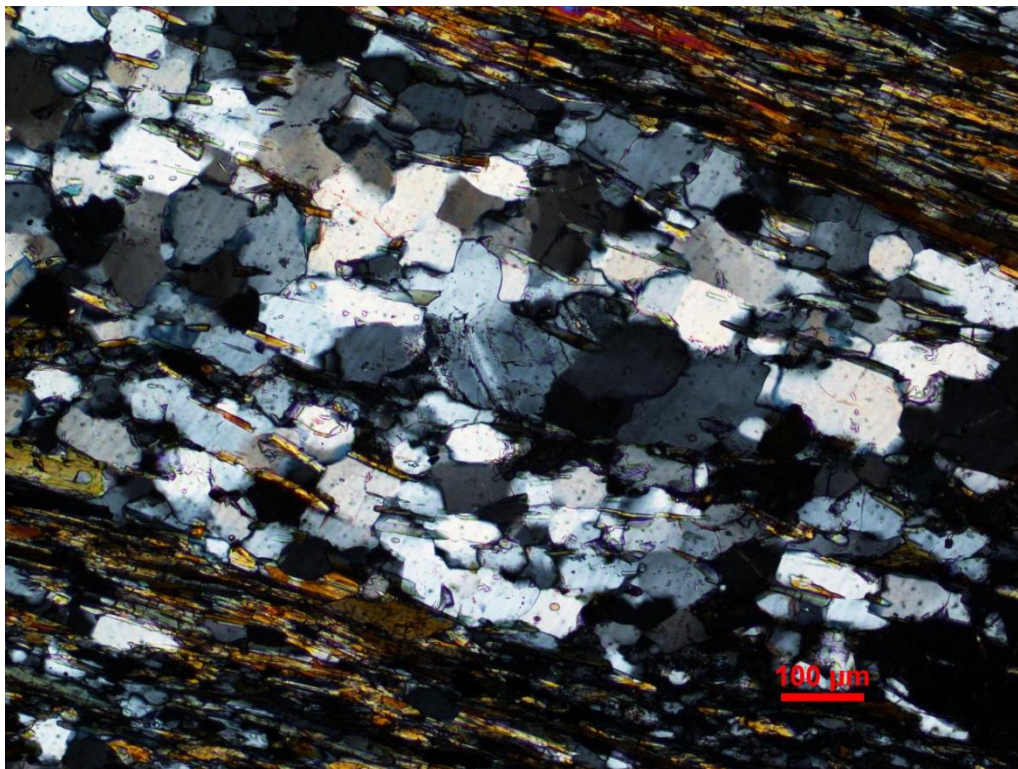
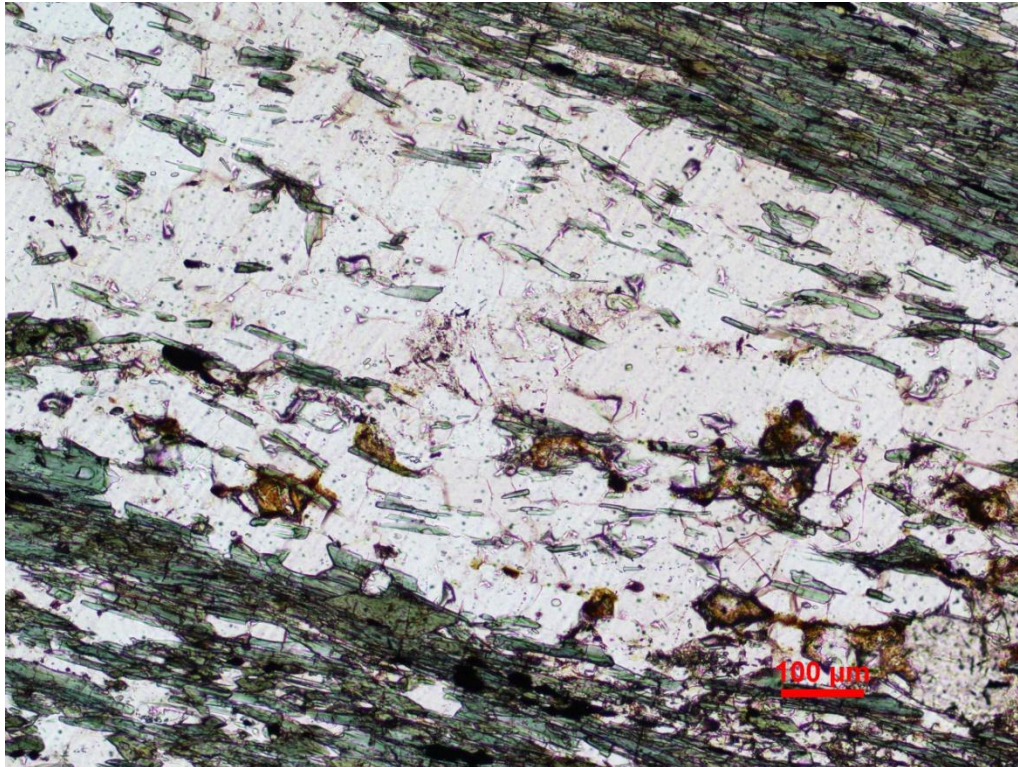
Sample CR-0026. Wide-field, full-thinsection view showing mylonitic, gneissic amphibolite with irregular quartz-plagioclase segregations. Top- plane light; Bottom- crossed polarizers.



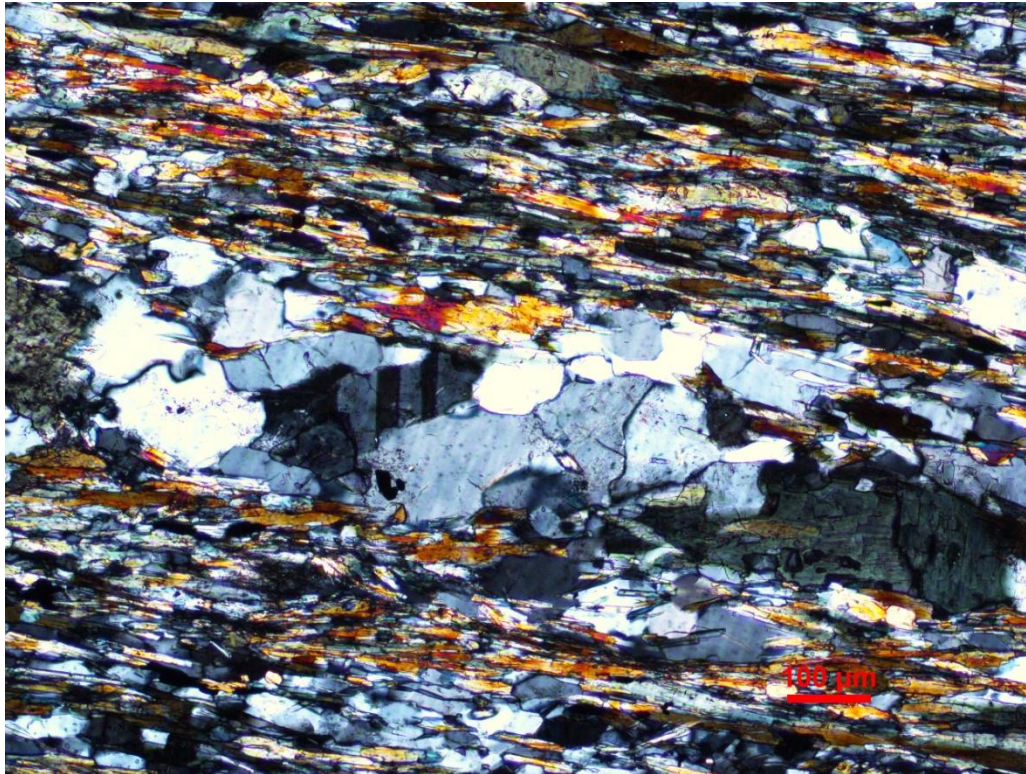
Sample CR-0026. Mylonitic amphibolite with gneissic quartz-plagioclase segregation lenses. Note suggestion of C-S mylonitic deformation fabrics. Top- plane light; Bottom- crossed polarizers.



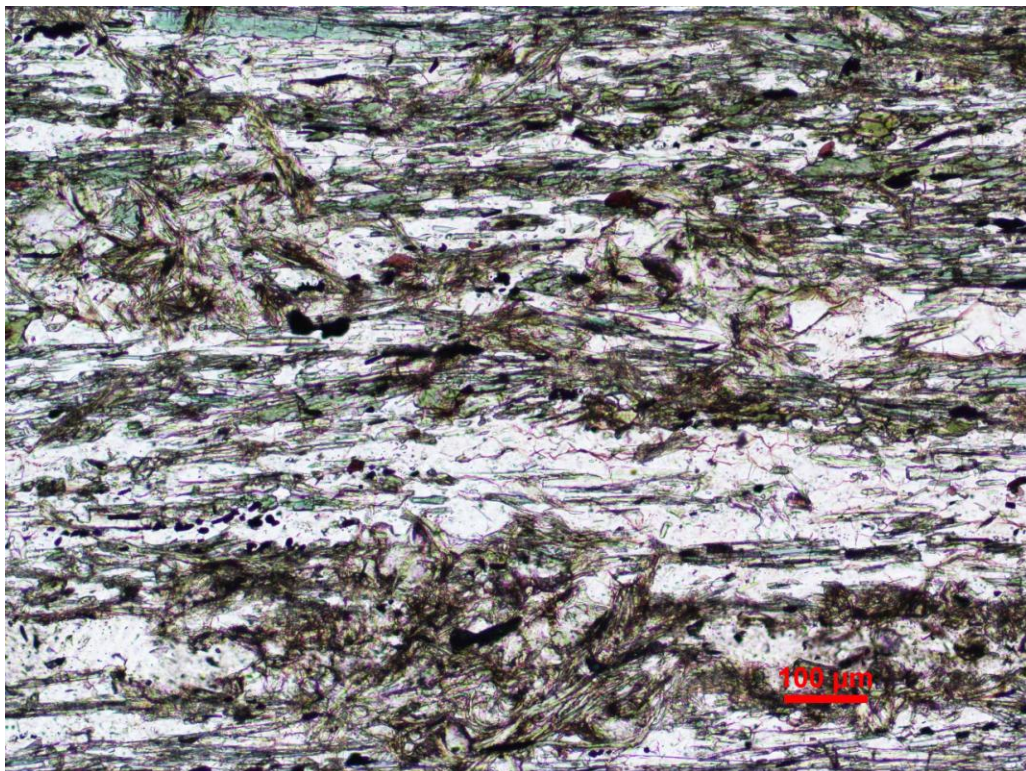
Sample CR-0026. Subhedral actinolitic amphibole micro-porphyroblasts (right) in mylonitic amphibolite. Top- plane light; Bottom- crossed polarizers.

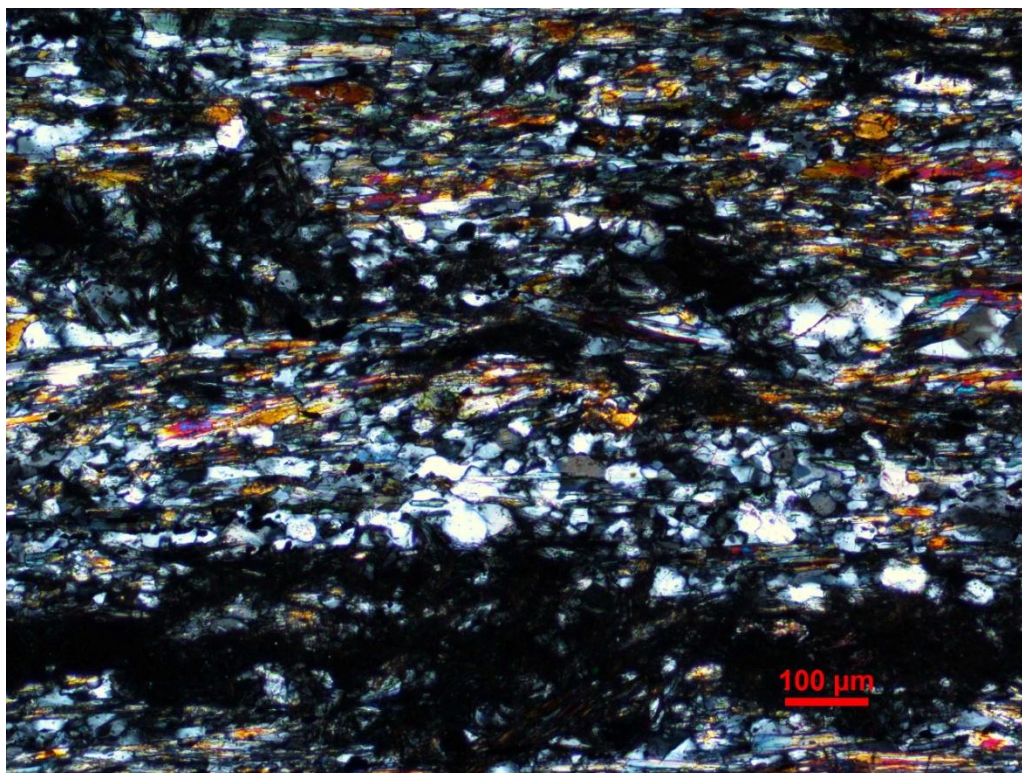


Sample CR-0026. Plagioclase with faint twinning (center) in quartz-plagioclase-amphibole segregation lens. Top- plane light; Bottom- crossed polarizers.

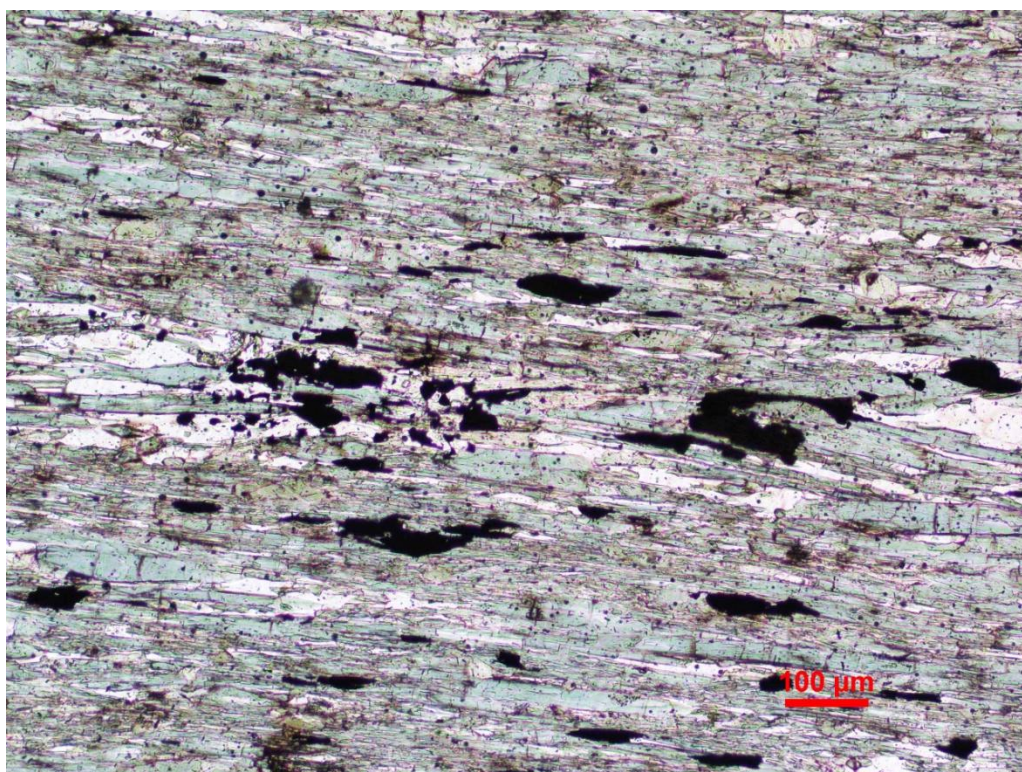


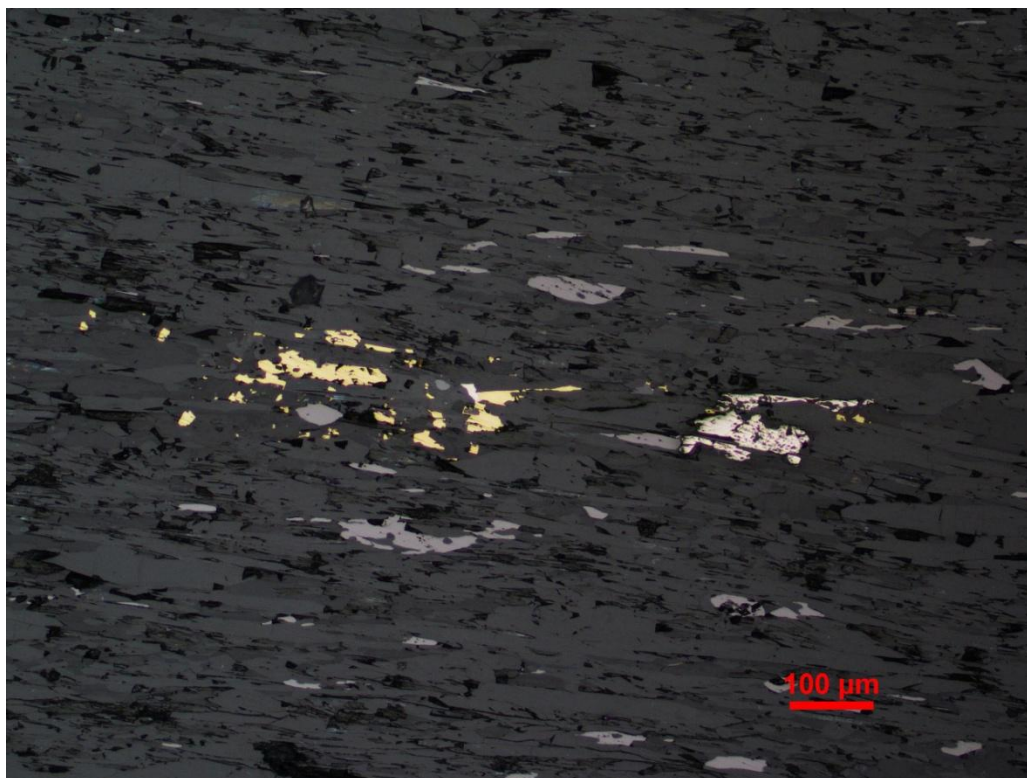
Sample CR-0026. Faint twinning in plagioclase (left center) in quartz-plagioclase-amphibole segregation lens. Crossed polarizers.



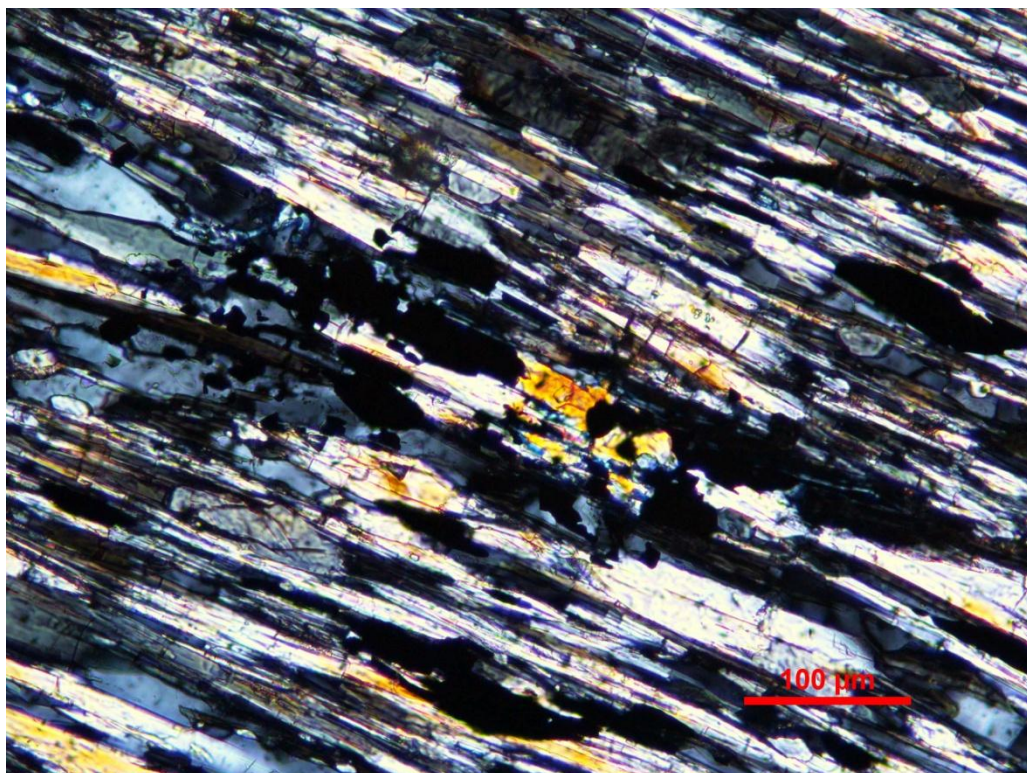


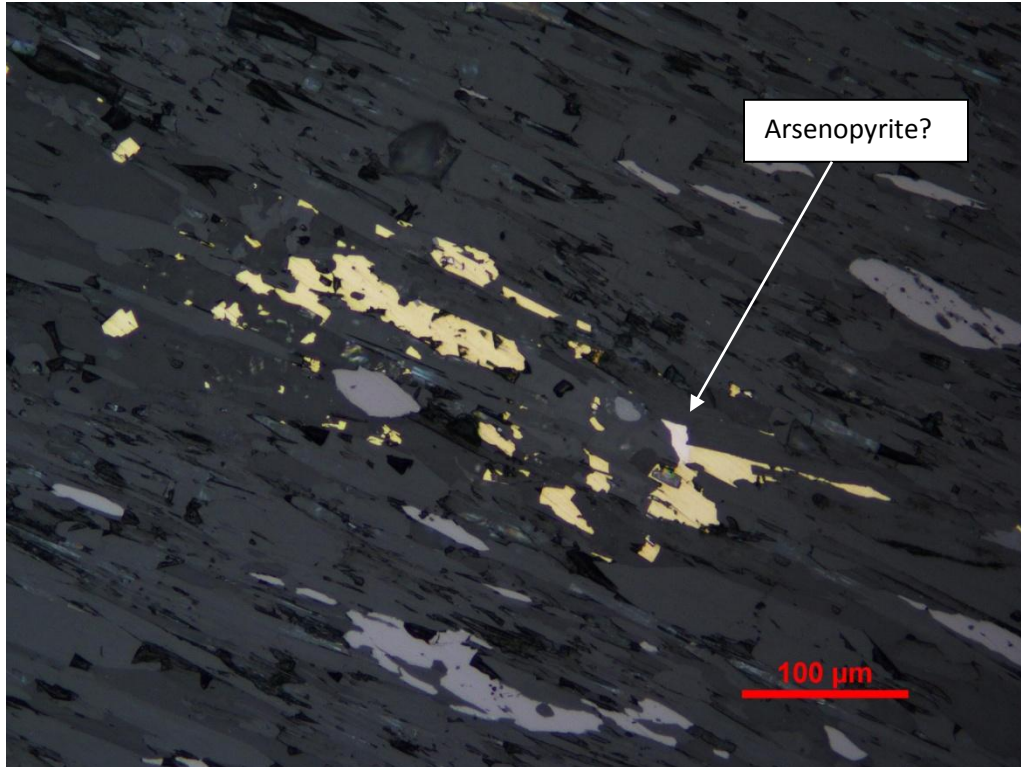
Sample CR-0026. Irregular chlorite bands and patches (black) locally replacing amphibole-plagioclase. Top- plane light; Bottom- crossed polarizers.



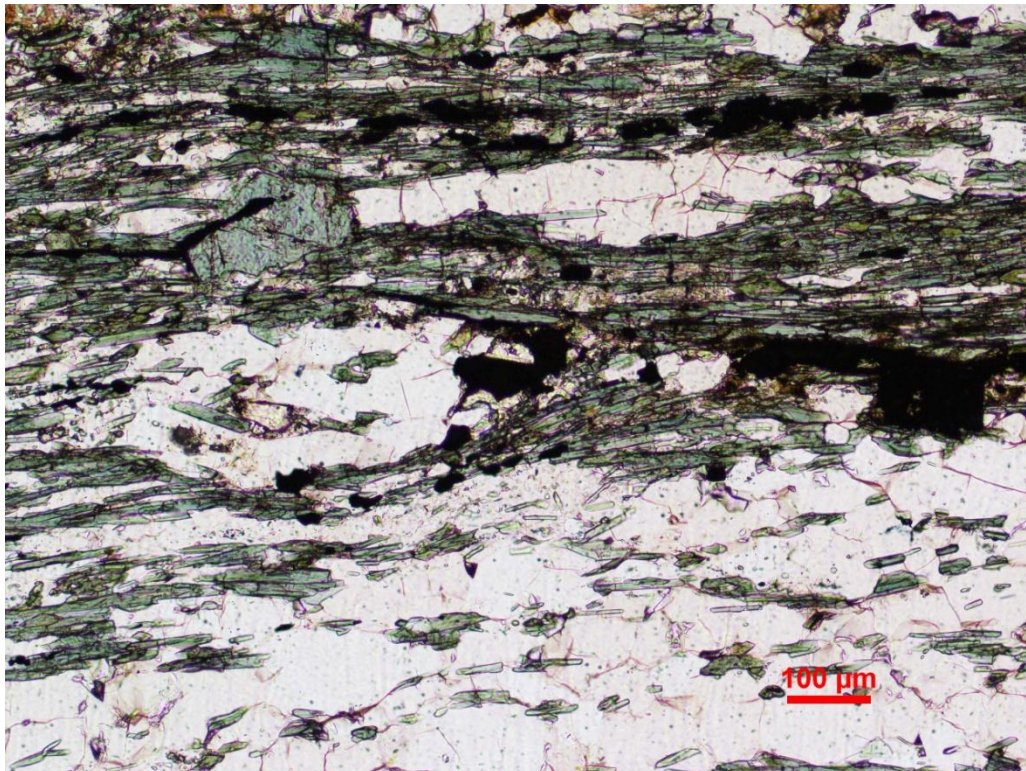


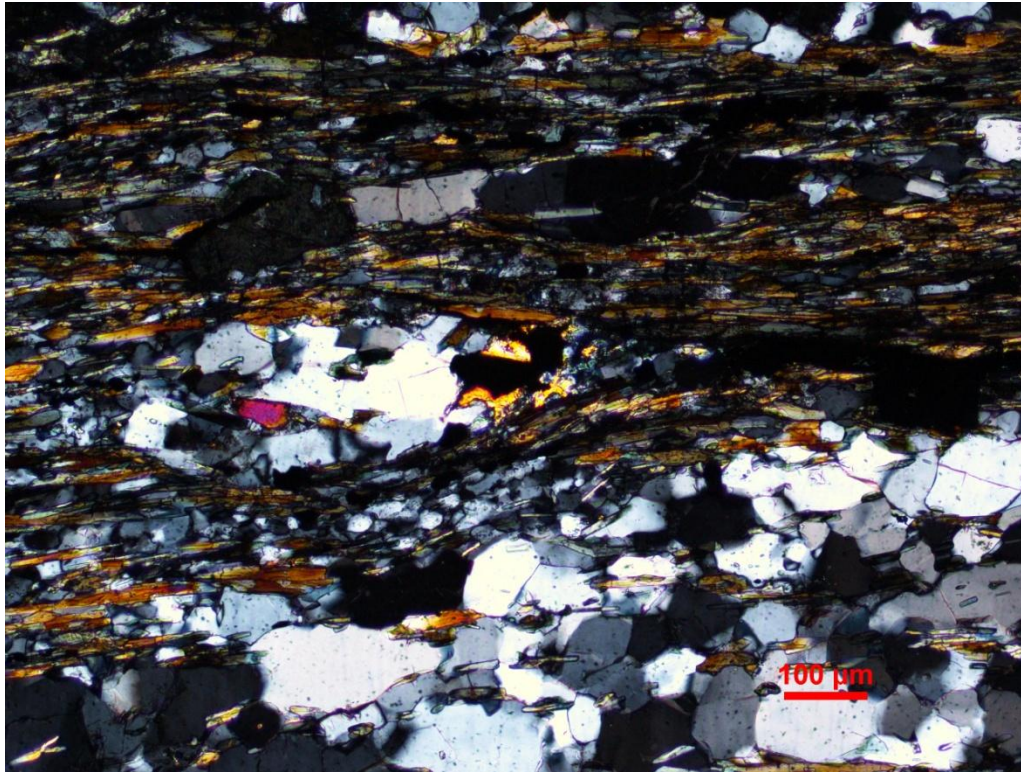
Sample CR-0026. Elongated disseminated ilmenite (lt gray), pyrite (right) and chalcopyrite (left) parallel amphibole lineation. Top- plane light; Bottom- reflected light.



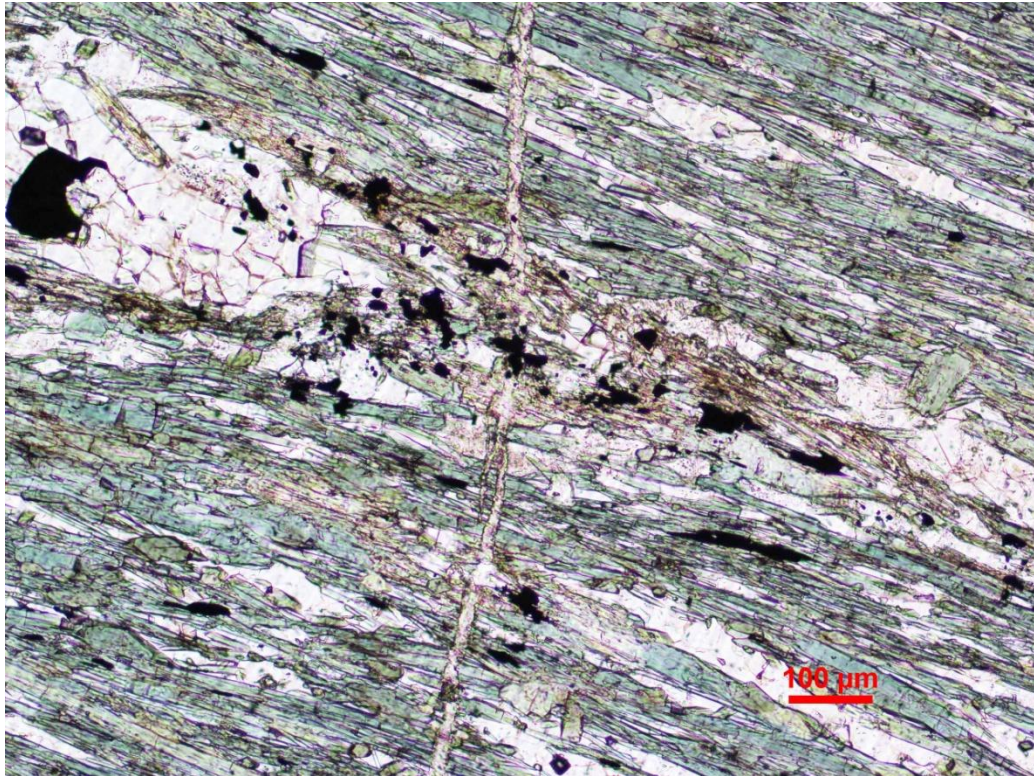


Sample CR-0026. Close up from above showing small arsenopyrite(?) grain associated with chalcopyrite and disseminated epidote. Reflected light.

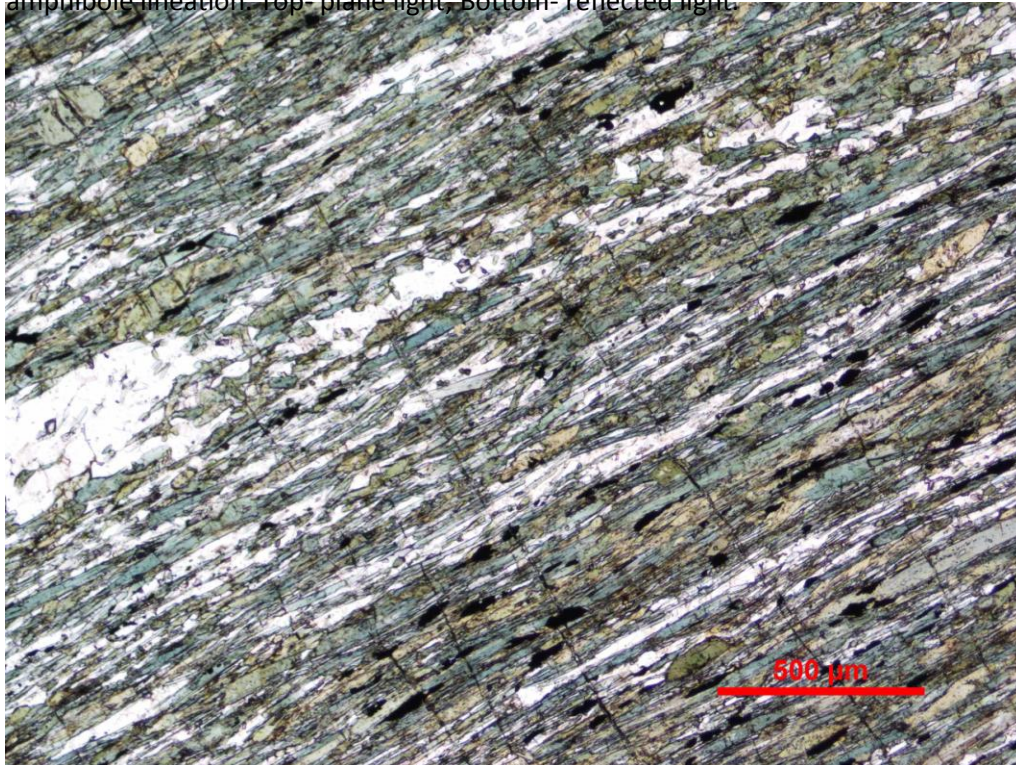




Sample CR-0026. Disseminated chalcopyrite associated with disseminated epidote in quartz-plagioclase segregation lens. Top- plane light; Middle- crossed polarizers; Bottom- reflected light.



Sample CR-0026. Disseminated chalcopyrite associated with fine chlorite veinlet at high angle to amphibole lineation. Top- plane light; Bottom- reflected light.



Sample CR-0026. Hairline chlorite veinlets normal to amphibole lineation and mylonitic fabric. Plane light.

