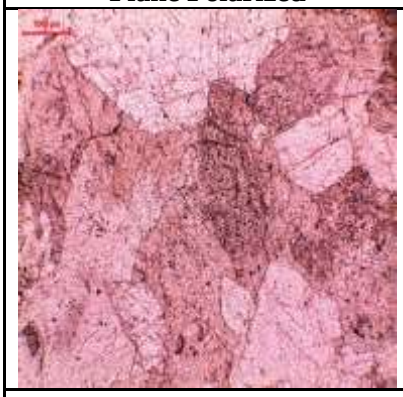
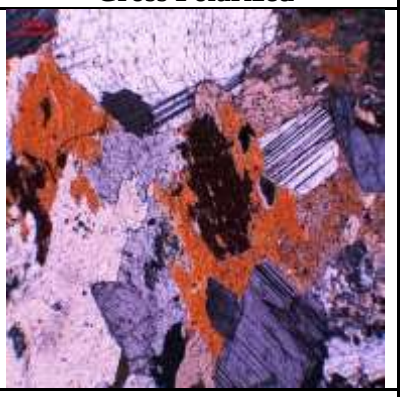
Plane Polarized	Mineral Name	Cross Polarized
	**AMPHIBOLE** **(Tremolite-Actinolite)** Mineral Group: **Inosilicate** Chemical Formula: **$Ca_2(Mg,Fe_2)_5Si_8O_{22}(OH)_2$**	

Color: Colorless, pale yellow	Birefringence-Interference color: 2nd order, high
Pleochroism: Not significant	Extinction: Inclined (10^0-15^0)
Cleavage: Perfect in two direction sometimes in one direction	Twinning: None
Fracture: Rarely	Alteration: Talk, antigorite
Relief: 1,60-1,68, Increases due to Fe content, High	Optical Sign: Biaxial (-)
Inclusion: None	Elongation Sign: +
Occurrance: Magmatic, metamorphic, rarely sedimentary	
Distinctive Properties: Color, alteration mineral	
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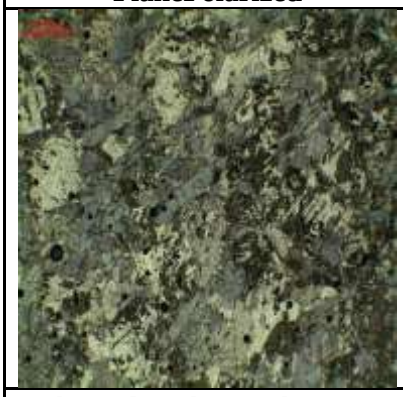
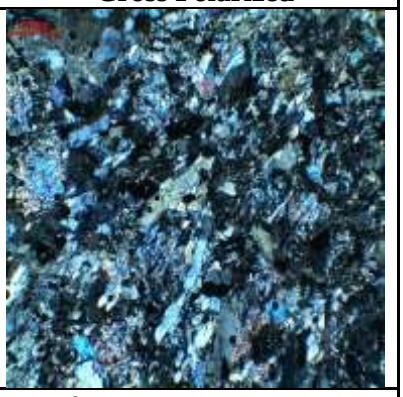
PlanePolarized	Mineral Name	Cross Polarized
	**AMPHIBOLE** **(Glaucophane)** Mineral Group: **Inosilicate** Chemical Formula: **$Na_2Mg_3Al_2Si_8O_{22}(OH)_2$**	

Color: Blueish, purple	Birefringence-Interference color: 1st and 2nd order, moderate
Pleochroism: Significant, moderate	Extinction: Inclined (5^0-10^0)
Cleavage: Perfect in two direction (intersect at 56 and 124 degrees), sometimes in one direction	Twinning: Rarely
Fracture: Rarely	Alteration: Chlorite, epidote
Relief: 1,59-1,64, Increases due to Fe content, High	Optical Sign: Biaxial (-)
Inclusion: Rarely	Elongation Sign: +
Occurrance: Metamorphic	
Distinctive Properties: Color, typical mineral for subduction zones	
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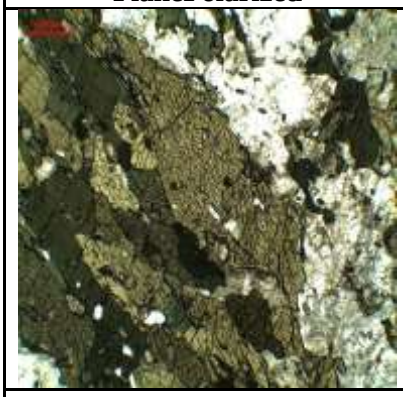
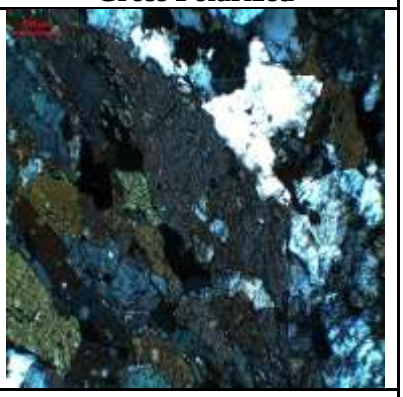
PlanePolarized	Mineral Name	Cross Polarized
	**AMPHIBOLE (Hornblende)** Mineral Group: **Inosilicates** Chemical Formula: **$(Ca,Na)_{2-3}(Mg,Fe,Al)_5(Al,Si)_8O_{22}(OH,F)_2$**	

Color: Generally green	Birefringence-Interference color: 2nd order, moderate
Pleochroism: Significant, strong	Extinction: Inclined (3^0-35^0)
Cleavage: Perfect - intersect at 56 and 124 degrees	Twinning: Sometimes twin lamels
Fracture: Possibly	Alteration: Chlorite, opaque
Relief: 1,64-1,67, High, Increases due to Fe content	Optical Sign: Biaxial (-/+)
Inclusion:Possibly (apatite, opaque minerals)	ElongationSign: +
Occurrance: Magmatic, metamorphic and sedimentary rocks	
Distinctive Properties: Color, pleochroism, cleavage, extinction angle	
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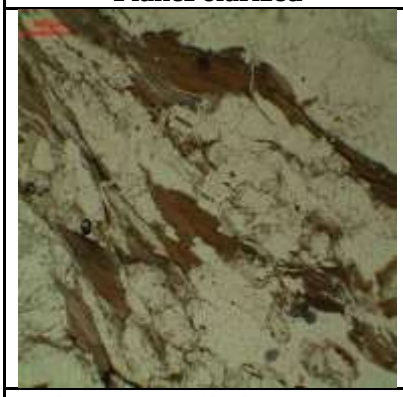
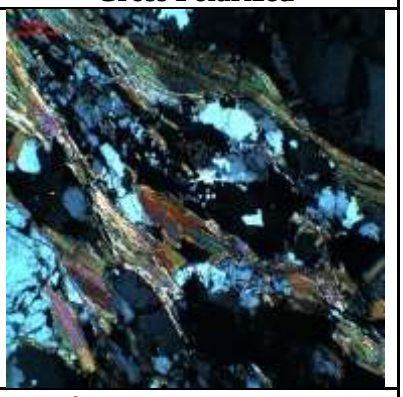
PlanePolarized	Mineral Name	Cross Polarized
	**BIOTITE** Mineral Group: **Silicates-Fillosilicate** Chemical Formula: **$K(Mg,Fe)_3AlSi_3O_{10}(OH,O,F)_2$**	

Color: Generally brown, green (due to Fe and Ti content)	Birefringence-Interference color: 3rd and 4th order very high
Pleochroism: Significant-strong	Extinction: Parallel, birdseye
Cleavage: Perfect in one direction	Twinning: Not seen
Fracture: Rarely	Alteration: Chlorite, opaq minerals
Relief: Moderate-high, 1.57-1.61	Optical Sign: Biaxial -
Inclusion: Zircon, rutile, apatite, titanite	Elongation Sign:+
Occurrance: Magmatic, Metamorphic and Sedimentary rocks	
Distinctive Properties: Brownish color, extinction, pleochroism, no clear extinction	
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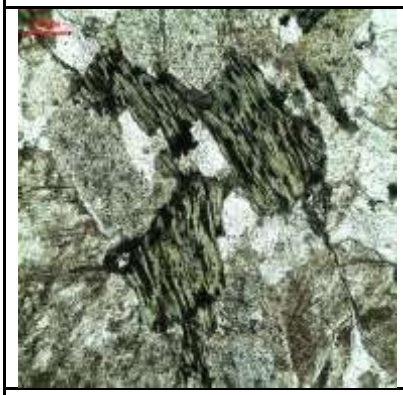
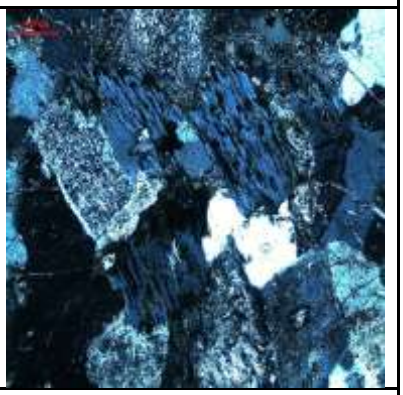
Plane Polarized	Mineral Name	Cross Polarized
	**CHLORITE** Mineral Group: **Phyllosilicate** Chemical Formula: **$(Mg,Fe,Al)_{12}(Si,Al)_8O_{20}(OH)_{16}$**	

Color: Light green (Mg), Dark green (Fe)	Birefringence-Interference color: Low, navy blue interference color
Pleochroism: Significant (Mg), Less significant (Fe)	Extinction: Parallel
Cleavage: Perfect	Twinning: None
Fracture: None	Alteration: Opaq mineral formation
Relief: Moderate- High	Optical Sign: Biaxial (-/+)
Inclusion: None	Elongation Sign:Biaxial(-/+)
Occurrance: Magmatic, Metamorphic and Sedimentary rocks	
Distinctive Properties:Color, interference color	
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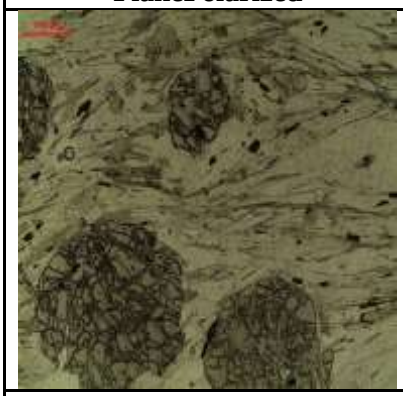
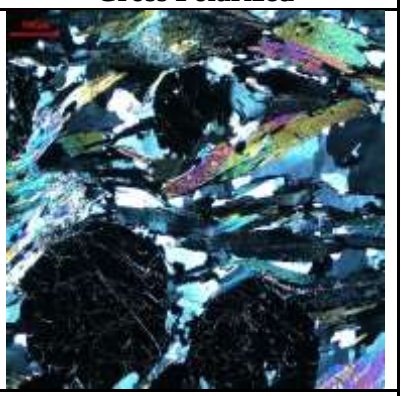
PlanePolarized	Mineral Name	Cross Polarized
	**MUSCOVITE** Mineral Group: **Mica Group** Chemical Formula: **$KAl_2(AlSi_3O_{10})(OH)_2$**	

Color: Colorless, Pale green due to Cr content	Birefringence-Interference color: 2nd, 3th order high
Pleochroism: None	Extinction: Parallel, Birdseye, Inclined
Cleavage: Perfect in one direction	Twinning: None
Fracture: None	Alteration: Hydromuscovite
Relief: 1.52-1.57 Low	Optical Sign: - Biaxial
Inclusion: Rarely	ElongationSign: +
Occurrance: Magmatic, Metamorphic and Sedimentary rocks	
Distinctive Properties: Colorless, birdseye extinction	
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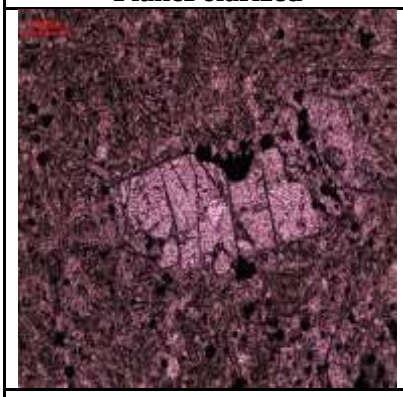
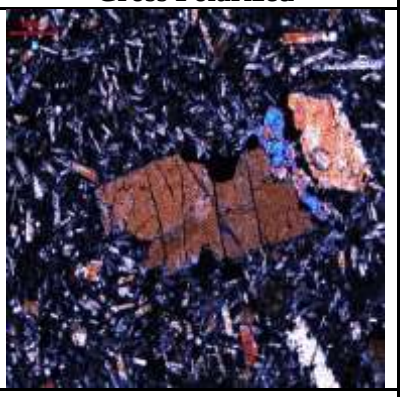
PlanePolarized	Mineral Name	Cross Polarized
	**PYROXENE (Ortopyroxene)** Mineral Group: **Inosilicate** Chemical Formula: **$MgSiO_3$**	

Color: Colorless, rarely pale green	Birefringence-Interference color: 2nd order high colors (red)
Pleochroism: None	Extinction: Parallel
Cleavage: Perfect in two direction (intersect at 87 and 93 degrees)	Twinning: Possibly
Fracture: Possibly	Alteration: Serpentine, chlorite, opaque mineral
Relief: 1,66-1,72, High	Optical Sign: Biaxial (+)
Inclusion: Possibly (ilmenite, opaque mineral)	Elongation Sign: (-/+)
Occurrance: Magmatic, Metamorphic and Sedimentary rocks	
Distinctive Properties:	
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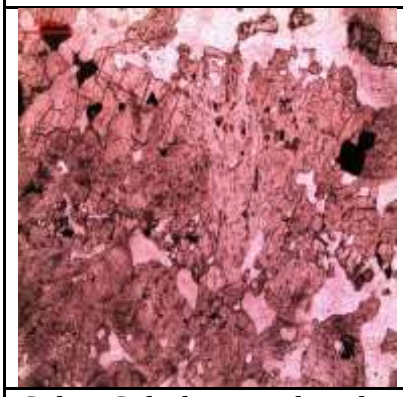
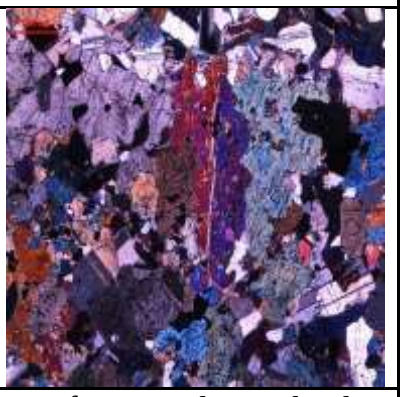
PlanePolarized	Mineral Name	Cross Polarized
	**PYROXENE (Augite)** Mineral Group: **Inosilicate** Chemical Formula: **$(Ca,Na)(Mg,Fe,Al)(Si,Al)_2O_6$**	

Color: Colorless, rarely pale green	Birefringence-Interference color: 2nd order high colors (red)
Pleochroism: None	Extinction: Inclined (35^0<)
Cleavage: Perfect in two direction (intersect at 87 and 93 degrees)	Twinning: Possibly
Fracture: Possibly	Alteration: Serpentine, chlorite, opaque mineral, uralitization
Relief: 1,66-1,72, High	Optical Sign: Biaxial (+)
Inclusion: Possibly (ilmenite, opaque mineral)	Elongation Sign: (-/+)
Occurrance: Magmatic, Metamorphic and Sedimentary rocks	
Distinctive Properties: Colorless, cleavage, extinction angle, no pleochroism	
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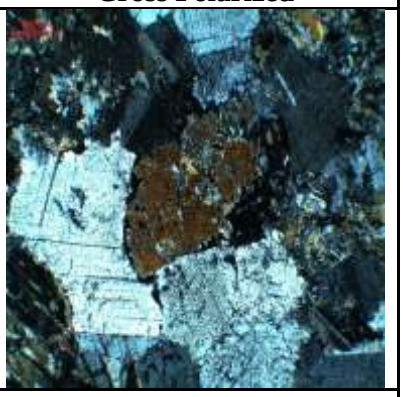
PlanePolarized	Mineral Name	Cross Polarized
	**PYROXENE (Diopside)** Mineral Group: **Inosilicate** Chemical Formula: **$MgCaSi_2O_6$**	

Color: Colorless, rarely pale green	Birefringence-Interference color: 2nd order high colors (orange)
Pleochroism: None	Extinction: Inclined (48^0-38^0)
Cleavage: Perfect in two direction (intersect at 87 and 93 degrees)	Twinning: Possibly
Fracture: Possibly	Alteration: Serpentine, chlorite, opaque mineral, uralitization
Relief: 1,66-1,72, High	Optical Sign: Biaxial (+)
Inclusion: Possibly (ilmenite, opaque mineral)	Elongation Sign: (+)
Occurrance: Magmatic, Metamorphic and Sedimentary rocks	
Distinctive Properties: Colorless, cleavage, extinction angle, no pleochroism	
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