
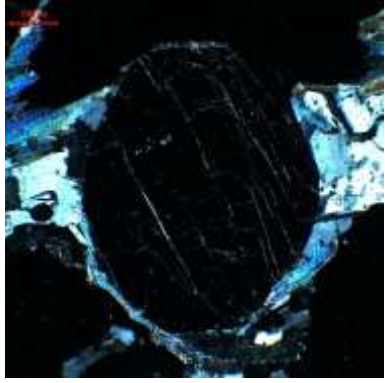

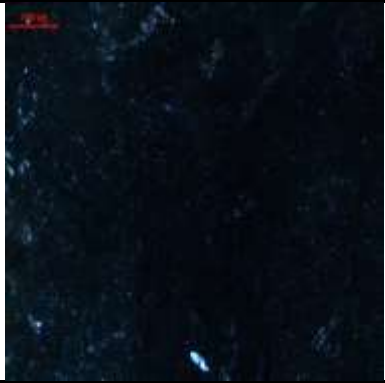
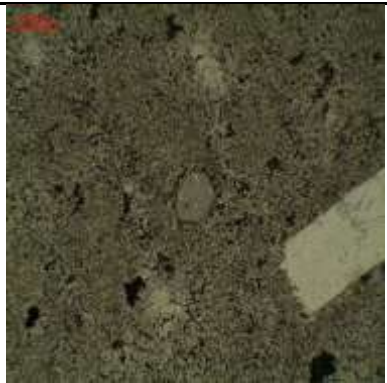
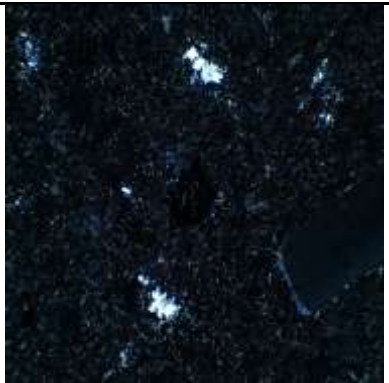



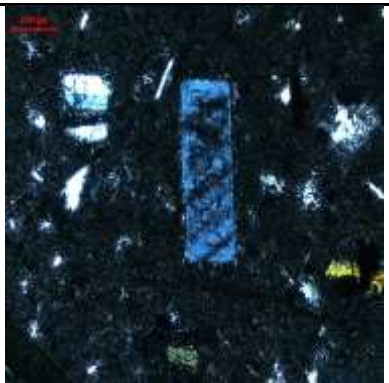
GEO 202 OPTICAL MINERALOGY – PROPERTIES OF MINERALS



Prof. Dr. Yusuf Kagan KADIOĞLU

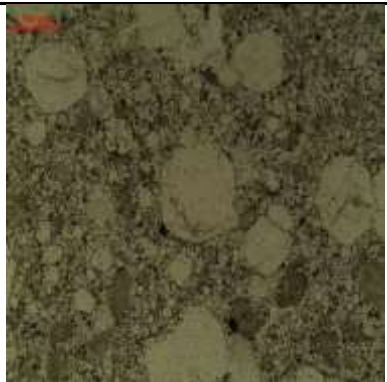
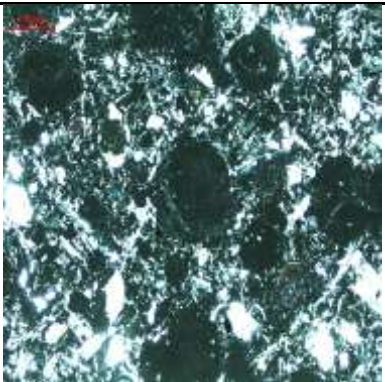
Plane Polarized	Mineral Name	Cross Polarized
	GARNET	
	Mineral Group: Silicates-Nezosilicates	
	Chemical Formula: (Mg,Fe,Mn) ₃ Al ₂ Si ₃ O ₁₂ almandine group Ca ₃ (Al,Fe,Ti,Cr) ₂ Si ₃ O ₁₂ andradite group	
Color: Colorless (Brown-melanite, green-uvarovite)		Birefringence-Interference color: Isotrope
Pleochroism: None		Extinction: None (Isotrope)
Cleavage: Not significant (110)		Twinning: None (Isotrope)
Fracture: Irregular fracture		Alteration: Chlorite-Sericite
Relief: 1,71-2.00 High		Optical Sign: Isotrope
Inclusion: Plentiful		Elongation Sign: Isotrope
Occurance: Magmatic, metamorphic and sedimentary rocks		
Distinctive Properties: High relief, rich in cracks, isotropy		
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PlanePolarized	Mineral Name	Cross Polarized
	FLOURITE	
	Mineral Group: Halite	
	Chemical Formula: CaF₂	
Color: Blue or Purple due to U & Th content		Birefringence-Interference color: Isotrope
Pleochroism: None		Extinction: None (Isotrope)
Cleavage: Excellent (111)		Twinning: None (Isotrope)
Fracture: None		Alteration: -
Relief: 1,434 Moderate		Optical Sign: Isotrope
Inclusion: None		Elongation Sign: Isotrope
Occurance: Magmatic and Sedimentary rocks		
Distinctive Properties:Isotropy, low relief		
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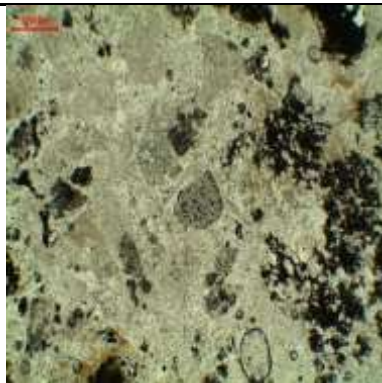

PlanePolarized	Mineral Name	Cross Polarized
	SODALITE	
	Mineral Group: Sodalite Group	
	Chemical Formula: Na₈(Al₆Si₆O₂₄)Cl₂	
Color: Colorless	Birefringence-Interference color: Isotrope	
Pleochroism: None	Extinction: None (Isotrope)	
Cleavage: Poor (110)	Twinning: None (Isotrope)	
Fracture: None	Alteration: None	
Relief: 1.48 Low	Optical Sign:	
Inclusion: Possibly	ElongationSign:	
Occurance: Magmatic		
Distinctive Properties:Low relief, isotropy, idiomorph		
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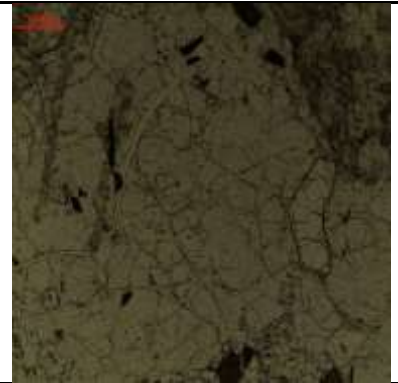
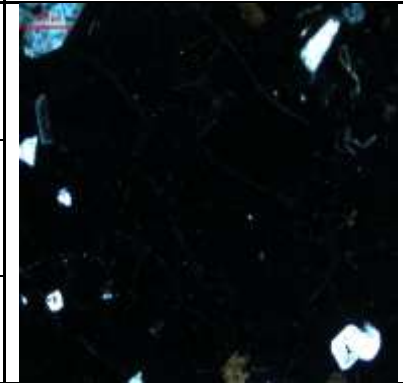
PlanePolarized	Mineral Name	Cross Polarized
	SANIDINE	
	Mineral Group: Silicates-Tektosilicates	
	Chemical Formula: KAlSi₃O₈	
Color: Colorless	Birefringence-Interference color: 1st order-low	
Pleochroism: None	Extinction: Parallel-Inclined	
Cleavage: Poor	Twinning: Carlsbad twinning, Rarely polysynthetic	
Fracture: None	Alteration: None	
Relief: 1.51-1.52 Very Low	Optical Sign: - (Monoclinic)	
Inclusion: None	Elongation Sign: -	
Occurance: Magmatic (Volcanic) rocks		
Distinctive Properties: Euhedral low relief, parallel extinction, simple twinning		
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PlanePolarized	Mineral Name	Cross Polarized
	NEPHELINE	
	Mineral Group: Silicates-Tektosilicates	
	Chemical Formula: (Na,K)AlSiO₄	
Color: Colorless, Yellowish grey		Birefringence-Interference color: Grey color of 1st's order.
Pleochroism: None		Extinction: Parallel
Cleavage: Not significant		Twinning: None
Fracture: None		Alteration: Sodalite-Analcime-Zeolite-Cancrinite- Clay minerals-Sericite
Relief: 1.53-1.54 Low		Optical Sign: - (Hexagonal)
Inclusion: None		ElongationSign: -
Occurance: Magmatic rocks		
Distinctive Properties:No twinning, typical mineral of alkali rocks, can't be found with primary quartz		
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PlanePolarized	Mineral Name	Cross Polarized
	LEUCITE	
	Mineral Group: Silicates-Tektosilicates Zeolite Group	
	Chemical Formula: K(AlSi₂O₆)	
Color: Colorless		Birefringence-Interference color: Isotrope
Pleochroism: None		Extinction: None (Isotrope)
Cleavage:		Twinning: None (Isotrope)
Fracture:		Alteration: Nepheline-Orthoclase
Relief:		Optical Sign:
Inclusion:		Elongation Sign: Isotrope
Occurance: Magmatic rocks		
Distinctive Properties:Euhedral, almost isotrope		
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PlanePolarized	Mineral Name	Cross Polarized
	NOSEAN	
	Mineral Group: Sodalite Group	
	Chemical Formula: $\text{Na}_8(\text{Al}_6\text{Si}_6\text{O}_{24})(\text{SO}_4) \cdot \text{H}_2\text{O}$	
Color: Colorless	Birefringence-Interference color: Isotrope	
Pleochroism: None	Extinction: Isotrope	
Cleavage:	Twinning: Isotrope	
Fracture:	Alteration:	
Relief:	Optical Sign: Isotrope	
Inclusion:	ElongationSign: Isotrope	
Occurance: Magmatic		
Distinctive Properties: Euhedral, low relief, isotropy, rich in inclusions		
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PlanePolarized	Mineral Name	Cross Polarized
	ANALCIME	
	Mineral Group: Zeolite Group	
	Chemical Formula: $\text{Na}_2(\text{Al}_2\text{Si}_4\text{O}_{12}) \cdot 2\text{H}_2\text{O}$	
Color: Colorless	Birefringence-Interference color: Isotrope	
Pleochroism: None	Extinction: None (Isotrope)	
Cleavage: None	Twinning: None	
Fracture: None	Alteration:	
Relief: 1.479-1.493 Weak	Optical Sign:	
Inclusion:	ElongationSign:	
Occurance: Magmatic rocks		
Distinctive Properties: very low relief, anhedral, pseudosection		
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PlanePolarized	Mineral Name	Cross Polarized
	VOLCANIC GLASS	
	Mineral Group:	
	Chemical Formula:	
Color: Colorless, light yellow, brownish	Birefringence-Interference color:	
Pleochroism: None	Extinction:	
Cleavage: None	Twinning:	
Fracture:	Alteration:	
Relief:	Optical Sign: Amorpheus	
Inclusion:Possibly	ElongationSign:	
Occurance:		
DistinctiveProperties:Isotropy		
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