ANDALUSITE

Aluminium silicate · Al_2SiO_5 polymorph · Mineralogical fact sheet

Al_2SiO_5 (aluminium silicate) · Orthorhombic system

PHYSICAL PROPERTIES

Property	Value
Hardness (Mohs)	6.5 – 7.5
Specific gravity	3.15 – 3.20 g/cm³
Refractive index	1.629 – 1.650
Birefringence	0.009 – 0.013
Optical character	Biaxial negative
Fracture	Subconchoidal to irregular
Cleavage	Poor to distinct on {110}
Lustre	Vitreous to subvitreous
Streak	White
Conductivity	Electrical insulator · non-magnetic

VARIETIES

Variety	Description
Common andalusite	Typical pleochroism in browns, greens and reddish tones
Chiastolite	Natural dark cross in cross-section · carbonaceous inclusions · Galicia (Spain)

Strong pleochroism (yellow / olive-green / reddish-brown): the most distinctive feature of the mineral, best observed with a dichroscope. The colour transition when rotating the gem is the main diagnostic test for authenticity.

IDENTIFICATION & AUTHENTICITY

✓ **Natural authentic**	Strong pleochroism · yellow/green/brown transition · natural inclusions
✗ **Imitation**	No pleochroism · uniform colour with no angular variation · suspiciously low price
Recommended tests	Dichroscope · 10x loupe · refractometer · NEVER scratch-test cut gems
Treatments	Not commonly treated in the market · pleochroism is 100% natural

SPECIAL PROPERTIES

Stable mineral under normal conditions, electrical insulator and non-magnetic. Part of the Al_2SiO_5 polymorph trio together with sillimanite and kyanite, each stable under different pressure-temperature conditions.

MAIN LOCALITIES

Country / Region	Relevance
Brazil (Minas Gerais)	World's main producer of exceptional gem quality
Madagascar	High-quality jewellery material
Spain (Galicia)	Excellent-quality chiastolite · collectors
Spain (Sierra Morena)	Classic historical reference locality
Sri Lanka	Limited, secondary production
Australia / China	Industrial deposits · refractory use

POLYMORPHS & TREATMENTS

vs.	Andalusite	Key distinction
Sillimanite	Strong pleochroism Biaxial negative	Same Al_2SiO_5 · stable at higher T/P · different structure
Kyanite	Hardness 6.5–7.5	Kyanite: anisotropic hardness 4–7 · same Al_2SiO_5, different pressure
Viridine	Al_2SiO_5 polymorph	Viridine is Mn-rich green sillimanite variety · different mineral
Tourmaline	RI 1.629–1.650	Tourmaline: trigonal system · uniaxial · different RI

CARE & MAINTENANCE

✓ **Cleaning**	Warm water + mild soap + soft brush + microfibre cloth
✓ **Storage**	Lined case · away from harder gems (diamond, corundum)
✗ **Avoid**	Ultrasonic cleaners · high-pressure steam · harsh chemicals
⚠ **Fragility**	Sensitive to hard knocks · avoid daily-wear rings

Historical context	Mineralogical classification	Curiosity
Described in 1798 by Jean-Claude Delamétherie, named after Andalusia (Spain). Classic localities: Sierra Morena and El Cardoso de la Sierra (Central System), which caused some historical geographic confusion about its exact origin.	Aluminium silicate (Al_2SiO_5) · Orthorhombic system. One of the three Al_2SiO_5 polymorphs together with sillimanite and kyanite · geological indicator of pressure-temperature conditions in metamorphic rocks.	Andalusite, kyanite and sillimanite form a trio of polymorphs that geologists use as indicators of pressure and temperature conditions in metamorphic rocks — a scientific tool as much as a beautiful gem.