

AXINITE

Triclinic borosilicate group · Mineralogical fact sheet

Ca(Mn,Fe,Mg)AlBSiO(OH) · Triclinic system

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PHYSICAL PROPERTIES		MAIN LOCALITIES	
Property	Value	Country / Region	Relevance
Hardness (Mohs)	6.5 – 7	Pakistan (Gilgit Baltistan)	Main current source of facetable material
Specific gravity	3.27 – 3.35 g/cm³	France – Isère (type locality)	Scientific and historical quality
Refractive index	1.674 – 1.706	Brazil – Bahia	Crystals up to 20 cm, facetable
Birefringence	0.010 – 0.012	Tanzania	Blue Mg-axinite · colour change
Optical character	Biaxial negative	Sri Lanka	Cinnamon-brown Fe-axinite
Fracture	Irregular / subconchoidal	USA – California	Various gemological varieties
Cleavage	Good in 1 direction	Switzerland – Alps	Yellow and orange tinzenite
Lustre	Vitreous to resinous	Mexico – Baja California	Collection specimens
Streak	White		
Fluorescence	Mg-ax: orange-pink UV · Fe-ax: none		

VARIETIES & COLOURS		DIFFERENTIATION FROM OTHER GEMS		
Species	Typical colours	vs.	Axinite	Key distinction
Axinite-(Fe) / Ferroaxinite	Clove-brown, plum, pearl-grey, blue	Andalusite	RI 1.674–1.706 SG 3.27–3.35	Higher RI & SG · Fe/Mn-ax. magnetic
Axinite-(Mn) / Manganaxinite	Yellow-green, violet, pink, reddish	Tourmaline	Triclinic · biaxial	Tourmaline: trigonal, uniaxial, harder (7–7.5)
Axinite-(Mg) / Magnesioaxinite	Blue, violet, lavender, pink, colourless	Topaz	Hardness 6.5–7	Topaz: hardness 8, perfect basal cleavage
Tinzenite	Yellow, orange (small crystals)	Glass	SG 3.27–3.35 Real pleochroism	Glass: SG ~2.5, no pleochroism

Strong pleochroism (trichroism): the same crystal displays different colours —brown, violet, blue— depending on the viewing angle. The most diagnostic property of the group. Cutting orientation determines the dominant colour.

OPTICAL PHENOMENA		CARE & MAINTENANCE	
Pleochroism (trichroism)	Strong to very strong · key property	✓ Cleaning	Warm water + mild soap + soft brush, dry immediately
Colour change	Only Mg-axinite from Tanzania · extremely rare	✓ Storage	Individual padded case, kept away from harder gems
Colour zoning	Fe-axinite Pakistan: violet, pink, blue zones	✗ Avoid	Ultrasonic · steam · sudden temperature changes · chemicals
Fluorescence	Mg-axinite: orange-pink LW UV · Fe-axinite: none	■ Rings	Always use protective settings (notable cleavage)

ELECTRICAL PROPERTIES

Axinite is **pyroelectric** (generates charge with temperature change) and **piezoelectric** (generates voltage when deformed). Fe/Mn-axinite: weak paramagnetic response. Mg-axinite: diamagnetic.

Historical context	IMA classification	Scientific curiosity
First description: J.G. Schreiber (1781). Definitive name: René Just Haüy (1797) for the axe-blade crystal habit. Type locality: Bourg-d'Oisans, Isère (France).	4 species: Axinite-(Fe) · Axinite-(Mn) · Axinite-(Mg) · Tinzenite. Strunz 9.BD.20 (Sorosilicates). Triclinic system. Renamed by IMA 2007/2008.	In 2016 the GIA published the first visual record of axinite as an inclusion inside quartz (California). A mineralogical rarity of scientific interest.