

Brazilian alexandrite

Alexandrite found in the district of Minacu (Goi's State), near the Pela Ema River, SE border of the Serra Dourada granite-gneissic dome. Among all varieties of chrysoberyl found, 10 to 15% are alexandrite of gem quality with distinctive color change.

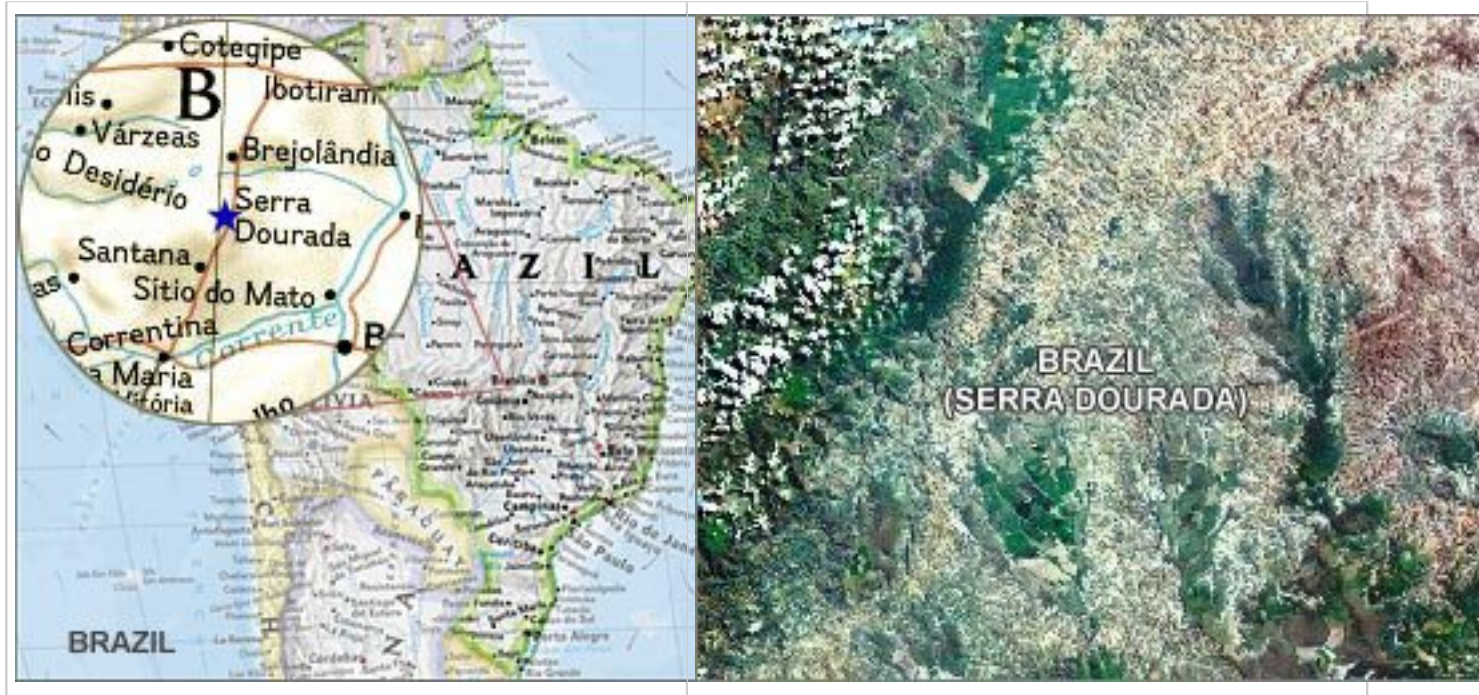
Locality details

Country	Brazil
Region	Central-West Region
Province	Goias
Locality	Serra Dourada
Latitude	-14.6833
Longitude	-49.2667
Altitude	1991
Time zone	UTC-3(-2DT)

Locality maps

Map

Satellite



See Alexandrite Tsarstone collectors guide, Brazilian alexandrite, Serra Dourada, <http://www.alexandrite.net/viewpage.html?id=ALXS-001-00005> (Information about Brazilian alexandrite findings and mining in Serra Dourada, Brazil.) (as of).

Primary alexandrite mineralization occurs in metasedimentary rocks of the Serra da Mesa Group in the district of Minacu (Goi's State), near the Pela Ema River, SE border of the Serra Dourada granite-gneissic dome. Among the varieties of chrysoberyl, 10 to 15% are alexandrite of good gemological quality. Most crystals show pseudo-hexagonal habits due to multiple twinings, with dimensions from 0.4 to 3cm. They contain inclusions of quartz, muscovite, biotite, garnet, monazite and a relatively high number of fluid inclusions. The Serra da Mesa Group in the area is represented by biotite-muscovite-quartz schist containing chrysoberyl, garnet, staurolite and kyanite porphyroblasts, fine lenses of feldspatic schist, thin amphibolite layers, pegmatites, exogreisens and quartz veins sometimes with emerald mineralizations.

Optical studies of alexandrite crystals revealed the presence of primary and pseudosecondary fluid inclusion. The microthermometry of primary fluid inclusion showed that during the formation of the alexandrite aquocarbonic solutions rich in NaCl, CaCl₂, and probably KCl and AlCl₃ were present, with salinities varying from 18.5 to 21.5 wt % NaCl equiv. and densities from 0.96 to 1.03g/cm³. Estimatives of P-T values resulted in the following ranges: 6.1-7.5 kbar at 535-576°C and 4.4-5.9 kbar at 530-565°C, depending on the thermodynamic equations used. The conditions for formation of chrysoberyl occurred at medium-grade amphibolite facies, determined by the intersection of the fields generated by the paragenetic associations, for kyanite and staurolite, with the isochores diagrams from the IF analysis. The studies indicate that the formation of the chrysoberyl started with the Be liberated from the quartz vein zone with beryl (emerald) and remobilized in the metamorphic fluids, where the precipitation may have been conducted by the presence of Al³⁺ from the host rocks.

According to the data obtained from field geology, petrography, mineral chemistry, geochemistry and fluid inclusions, it can be concluded that the metasedimentary rocks from the Serra da Mesa Group were intruded by the Serra Dourada Massif. The minerals staurolite, kyanite, garnet and alexandrite, that comprise metamorphic paragenesis of amphibolite facies, are restricted to the metasedimentary rocks in contact with the granite, evidencing a halo of contact metamorphism. The alexandrite mineralization is associated to mafic bands from the Serra da Mesa schists, specifically in the garnet-staurolite-kyanite-biotite-quartz schist. The ore genesis is related to the existence of beryllium, aluminum and chrome in the system. The granitic magma supplied beryllium and aluminum, crystallizing the mineral beryl. Because of the contact metamorphism due to the intrusion of the biotite granite, around 1.6 Ga, beryl was decomposed, generating chrysoberyl. The garnet-amphybole-quartz schist that occurs intercalated with the Serra da Mesa Group schists is the most probable source of chromium. The rocks of the studied region were later affected by the Brasiliano orogenic cycle (ca. 0.6 Ga), which gave rise to green schist paragenesis and caused deformation and cracking of the garnet, kyanite, staurolite and alexandrite of the mineralized rocks.