

World's greatest cordierite find?

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In the fall of 2012 a hitherto unique discovery of cordierite crystals displaying surprisingly sharp crystals was made, micromounts excluded. The outcrop was discovered within whiteschist altered granulites between Risør and Søndeled, South-East Norway. Crystal sizes reached up to 12 cm, most averaging 3-5 cm (Figs. 1 & 2, same specimen untrimmed/trimmed). A small number of crystals exhibited complex terminations (Fig. 3). Cores, as observed normal to [001], were frequently transparent to translucent vivid light blue, whereas rims were typically colorless to pale greenish due to slight alteration (Fig. 4). However a very few completely unaltered light sky blue crystals were recovered as well (Fig. 5).

These crystals precipitated during isostatic conditions from metasomatically derived fluids within an orthopyroxene-gedrite-phlogopite gneiss. Accompanying primary phases were quartz, rutile and phlogopite; secondary stage(s): kyanite, magnesiodumortierite, talc, quartz, chlorite and andalusite. Primary CO₂-rich fluid inclusions were found in the coexisting quartz, whereas the cordierite was barren of any fluid inclusions.

Finds of similar mineralogical outcrops are common to the metapelites occurring from Risør northwards towards Kragerø. However, cordierite encountered as occasional crystals are commonly blunt exposing progressed alteration of lower amphibolite to greenschist facies mineralogy. Though gem quality cordierites are documented from within this very same area, no well-defined euhedral gem crystals have yet been acknowledged. Those found are often related to allotriomorphic single crystal "eggs" preferably occurring in hinge zones of fold limbs rich in deformable minerals such as phlogopite and orthoamphiboles. The close proximity of these layered/fibrous minerals to the cordierite eggs circumvented entrance of retrograde fluids and subsequent local cordierite stress build up, thereby enhancing odds of lasting flawlessness.

Having studied papers (1920-2010) referring to acclaimed finds of cm sized gem cordierite crystals from the Bamble sector (and elsewhere), going back to the original texts, notably by Holm (1824) and Weibye (1846, 1847); they all proved to be incorrect. And having contacted curators of many of the major mineralogical museums worldwide e.g., Berlin, London, Paris, Houston, Barcelona, New York and Washington D.C, obtaining information on their exhibited cordierite specimens, it soon became clear that the cordierite crystals from this new discovery indeed represented something out of the ordinary.

References

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