

Abstract Submission

T3 - Minerals, systematics, gems, collections
New Minerals, Nomenclature, and Classification

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Crystal chemistry of tourmalines from Minas Gerais, Brazil

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Abstract Content: The mining State of Minas Gerais, located in the south-eastern part of Brazil, is one of the main producers of high-quality tourmalines in the world. Most of these minerals formed within the granitic pegmatites of the Eastern Brazilian Pegmatite Province. They are currently considered as a supergroup of rhombohedral borosilicates with a $R3m$ space group, and a general formula that may be written as $XY_3Z_6[T_6O_{18}](BO_3)_3V_3W$.

Electron-microprobe and LA-ICP-TOF-MS analyses provided accurate data about the major and trace elements concentrations in each sample. Compositions generally vary along the elbaite-schorl series, with sometimes compositional zonations between both end-members. One sample from the Lavra do Urucum pegmatite (KF-081) shows a rossmanite composition, with the Y site occupied by two Al and one Li cations. Another sample from the same pegmatite (WR-045) is significantly enriched in REE and in Ca, with values reaching 30 ppm La, 56 ppm Ce, 6 ppm Pr, 18 ppm Nd, and 1.90 wt. % CaO. Such a composition shows an evolution towards liddicoatite.

Some seventeen samples have also been submitted to single crystal X-ray diffraction experiments, in order to refine their crystal structure. The unit-cell parameters, between $15,82 \text{ \AA} \leq a \leq 15,93 \text{ \AA}$ and $7,09 \text{ \AA} \leq c \leq 7,13 \text{ \AA}$, are consistent with elbaite-to-schorl compositions. A detailed examination of polyhedral distortion coefficients indicates an inverse correlation between the distortions of the Y and Z sites. Concerning the Z site, the highest distortion values are observed for schorl-rich compositions.

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