

Raman spectroscopy and electron microprobe measurements as investigation methods for different coloured schorl tourmalines

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Ten single schorl crystals, displaying different colours in thin sections, have been studied with Raman Spectroscopy and Electron Microprobe. The Raman spectra were recorded at the 100-1200 cm^{-1} area and show a clear difference (a) between different coloured tourmalines, i.e. blue, orange and green ones and (b) furthermore between different shades of the same colour. The three main Raman bands for tourmaline lie in the region of 400, 800 and 1100 cm^{-1} changing colour is displayed by movement of the three main bands and also by appearance of new bands within the spectrum. In case of the blue schorls, the 800 cm^{-1} band is totally removed. The orange shaded tourmalines show a twin band at 800 cm^{-1} which flips over depending on the darkness of orange. So Raman spectroscopy makes it possible to characterize the visual coloured schorl zones. To complete our measurements the different coloured tourmalines were also measured with electron microprobe to display the correlation between optical colour zoning, Raman measurements and chemical differences distinguished by electron microprobe.

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