

**INFRARED ABSORPTION AS A USEFUL TOOL TO SEPARATE
NATURAL FROM SYNTHETIC AMETHYSTS**

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The study presents results of investigations made for a representative series of samples that consisted of natural and synthetic amethysts. The investigations have been conducted in a parallel and vertical direction to the optical axis (*c*) of the stones. Infrared absorption has been used for testing and developing analytical methods useful for detection of differences between these two categories of stones. We were able to reject several criteria of selection proposed by authors of previous publications - SMAALI (1998), ZECCHINI et al. (1999) - who claimed that the absorption peak at 3595 cm⁻¹ should only appear in the case of natural amethysts. Furthermore, we were able to contradict their claim that the absorption peak at 3543 cm⁻¹ is only observed for synthetic amethysts. The deconvolution of the spectra allows the determination of the band widths. This value (important or feeble) will be criteria of differentiation between the natural and the synthetic amethysts. Moreover, for the synthetic "prismatic" amethysts, only the absorption bands at 3543, 3585, 3614 cm⁻¹ have been revealed, whereas the bands at 3589 cm⁻¹ and 3595 cm⁻¹, as observed by NOTARI et al. (2001), were not detectable in the case of using the same stones. In addition, the investigations of peaks at 3575 cm⁻¹ in amethyst of Bolivia (Altiplano) and at 3630 cm⁻¹ in some amethysts from Madagascar, Mexico (Vera Cruz) and Russia (Ural), allows us to suggest that there are specific properties originating in these countries' amethysts. It should be taken under account, which further measurements taken for a larger number of amethyst samples are needed in order to prove this claim. Finally we were able to say that with the orientation only the intensity of the peaks changes, but none of them disappeared. By inference, the significant infrared absorption of amethysts can be measured in any direction.

References

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