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IDENTIFICATION OF POLYMER-FILLED AQUAMARINE

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Using oil for clarity enhancement in emeralds has been considered standard practice, and there has been a lot of interest in which type of oil is used. However, there has been little attention paid to oil treatments for aquamarine.

Recently, our gemological laboratory has received requests for aquamarine that has been treated with wax and resin-based fillers such as Opticon. Untreated aquamarine does not typically respond to the long and short waves ultraviolet lamps, but the samples in this study exhibited blue-white fluorescence under UV long-wave. The surface of the aquamarine roughs was covered in resin-based fillers, and under magnification, a typical flash effect of polymer filling was observed in almost all of the samples.

FTIR analysis revealed the diagnostic features of the polymers in the 3100-2850 cm^{-1} region, with peaks at 3051 and 3035 cm^{-1} belonging to the benzene C-H bond, and peaks at 2962, 2927, and 2873 cm^{-1} belonging to the ethyl C-H bond. No heavy elements such as lead were detected by EDXRF spectroscopy.

The samples examined in this study were already in the rough state filled with polymers. Although we have not encountered faceted samples filled with polymers on the market yet, this treatment appears to be easily applicable to faceted stones as well.

REFERENCES

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