

Micro-Raman and PIXE-PIGE analysis of gemstones of the Medicean Collection of "Carved Stones"

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The Medicean Collection of "Pietre Lavorate" is part of the Mineralogy and Lithology collection of the University of Florence Museums' System and counts minerals, gems and fine carved stones of great historical and mineralogical value. For this project, a selection of 53 gemstones belonging to the most ancient core of the Collection was characterized by micro-Raman and PIXE-PIGE analysis in a non-destructive way. The goals were: 1) the identification of the mineralogical species and 2) the determination of chemical markers suitable for differentiating gemstones catalogued with different provenance. The analyses identified the presence of emerald, quartz, topaz, opal, cordierite and garnet. The concentration of 29 major, minor and trace elements (e.g. Cr and V), including light elements (e.g. Be and F), was determined and the differences in concentration of transition, chromophore and lithophile elements allowed to discriminate several specimens of emerald and topaz.