

## Summary

This thesis investigates the potential and limits of portable Raman spectrometers for their application *in situ* in the environment of museum collections. The data sets were obtained at the two locations. The first measurement took place in the Jewish Museum in Prague. Here we have studied stones from a silver Torah shield from the first half of the nineteenth century. This shield is decorated with a set of precious and semi-precious stones and glass imitations. The shield originates from Poland and has been studied using two portable Raman spectrometers (785 nm and 532 nm excitations).

The second measurement took place in the premises of the Prague Loreto where we had available, at that time still unshown, objects of art for the forthcoming new exhibition. It was about jewelry like earrings, rings, bracelets and brooches, also about ordinary objects of daily use like mirrors, bowls and perfume bottles, or about the objects with religious themes, mostly crowns for the Virgin Mary and baby Jesus.

The obtained Raman bands correspond well with the reference values of the minerals, the deviation ranged in the order of  $\pm 3 \text{ cm}^{-1}$ , which in general permits unambiguous identification of phases. Portable handheld Raman spectrometers working with a laser wavelength of 785 nm and 532 nm were able to quickly and unambiguously identify almost 60 stones that adorned the Torah shield. The shield was decorated with one blue aquamarine, three purple amethysts, thirteen red garnets (which were later identified as almandines), three white pearls, fifteen pieces of red coral and five chalcedony, one of these was white, and the remaining four were red. All the other colored stones on the shield have been evaluated as glass imitation. Somewhat chaotic concept of placing stones of various colors, shapes and sizes and mainly to the large volume of glass imitations support the presumption that the mounted stones were collected and donated by Jewish households to decorate originally pure silver shield. The situation in Loreto was rather similar. Items with religious themes were, once again, profusely decorated with colorful glass imitations. The more valuable pieces were decorated with garnets and pearls. For jewelry are frequently occurring diamonds and garnets. Items of daily use have been decorated with glass imitations and the different varieties of quartz (agate, chalcedony, jasper).

Portable Raman spectrometers represent an ideal tool for the rapid and unambiguous identification of precious stones, semi-precious stones and various imitations, which are adorned with historical items, *in situ* in the premises of the museum's collections-friendly non-destructive way. They can be recommended for gemological labs and elsewhere where there is a need of fast and unambiguous identification of stones on historical artifacts.