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Micro-Raman and ATR-IR spectroscopy analysis of pigments of mural paintings from the Rila Monastery complex (Bulgaria)

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Rila Monastery, an eminent example of the architecture and fine arts of the Bulgarian national Revival, is a large Eastern orthodox monastery complex comprising in cultural, dwelling and farming buildings [1-3]. The complex includes several churches: the main monastery church "The Nativity of the Virgin", "The Presentation of the Virgin Mary" Church, "The Assumption of St Ivan Rilski" Church, "St. Peter and Paul" Church in the nunnery "Orlica", "The Assumption of The Virgin Mother" Church in the nunnery "Pchelina", "St. Evangelist Luka" Church in the old hermitage etc. [2]. They were built over a long period of time – between the 15th and the 19th century and painted by famous Bulgarian artists, representatives of different schools. Dimitar and Simeon Molerov (the Bansko school), Ivan Obrazopisov, Dimitar Zograph, and Kosta Valjov (Samokov), Zahari Zograph, Stanislav Dospevski and many unknown artists have created numerous works of high quality monastic fine art around the monastery churches [2,4].

Characterization of the pigment palette and binding materials in the mural paintings allow identifying the differences in the technology related to particular time periods and different artists. As a part of our ongoing study on the mural paintings in the Rila monastery, we conducted a micro-Raman and ATR-IR investigation on samples from "The Assumption of St Ivan Rilski" Church painted in the first half of the 19th century. Micro-Raman and ATR-IR spectroscopy was used to provide molecular and structural information for the inorganic as well as for organic materials as fast and non-destructive way without any sample preparation steps.

Ten samples were taken from different locations of the murals in order to include various colours from the background and the figures. The most significant pigments identified were: azurite, red ochre, green earths, red lead, lime white, carbon black.

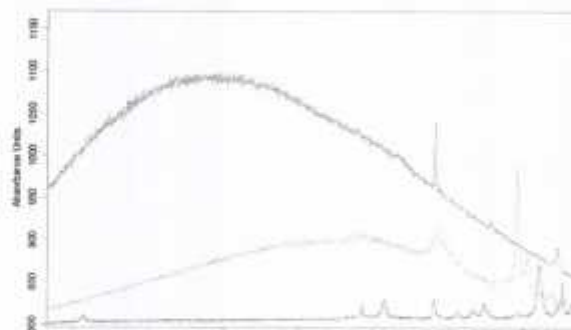


Figure 1. Micro-Raman spectra of identified pigments: azurite (in blue), red lead (in orange), lime white (in green).