INVESTIGATION OF PORCELAIN CARDS USING COMBINED SPECTROSCOPIC TECHNIQUES

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In the 19th century, porcelain cards were very often used in the Flemish region (Belgium) as a medium to advertise, to invite, or in general, to inform people on special and specific social events, or on private business activities. The production of these cards was done by a lithographic procedure, but because this manufacturing process has not been described in literature, the details on the actual production of the porcelain card can be considered as being lost. There seems to be some common belief amongst collectors and curators that the front of the cardboard is covered with a thin layer of lead white ($2PbCO_3.Pb(OH)_2$) mixed with kaolin ($Al_2Si_2O_5(OH)_4$). This mixture was pressed on the cardboard to give it a high-gloss finish, having the look of porcelain, so probably explaining the name of the cards.

Recently, the Department of Analytical Chemistry of the Ghent University acquired the laboratory EDAX EagleIII micro-XRF spectrometer, and the Bruker Optics ‘Senterra’ Raman spectrometer. The EagleIII spectrometer is based on polycapillary optics, while the Raman spectrometer is equipped with 532 (Nd:YAG) and 785 nm (diode) laser sources. Both Raman and XRF allow the investigation of samples on the microscopic level in a non-destructive manner which is essential in cultural heritage projects. Moreover, combining Raman information and XRF information promises a more easy interpretation of the spectroscopic data by complementing molecular information with element information and vice versa.

In this work the combination of the micro-XRF technique and the micro-Raman method is explored in order to characterize selected porcelain cards. Next to the initial goal of identifying the materials being used in a porcelain card, special attention has been paid to data evaluation strategies using the resulting “fused” data set made from the data of the different techniques, and to see what effect this ‘data fusion’ has on the interpretation compared to the discussions that are based on only one type of spectroscopic data (i.e. only the XRF data set, or only the Raman data set).