Development of an Analytical Protocol for Characterisation of Historical Mortars

Laura Rampazzi¹, Cristina Corti¹, Chiara Colombo², Claudia Conti² and Marco Realini²

¹ Department of Chemical and Environmental Sciences, University of Insubria, Italy, laura.rampazzi@uninsubria.it
² C.N.R. National Research Council, ICVBC Institute for Conservation and Valorisation of Cultural Heritage, Section ‘Gino Bozza’, Italy

Abstract The definition of the composition, the technological process and, last but not least, the provenance of the raw materials of historical mortars is still difficult and unsatisfactory, notwithstanding a number of guidelines proposed in the last years. Problems are usually associated with the composite nature of materials. On the contrary, in case of archaeological building investigations conservation scientists call for a valid and reliable analytical tool to classify mortars by the compositional and morphological points of view and to enlighten the conservation history and the sequence of the building interventions. The paper describes the development of an integrated protocol of chemical, mineralogical and microscopic analyses for the characterisation of mortars. The key idea was to set up and standardise an analytical methodology whose basic objective is the identification of major and minor constituent materials and binder/aggregate ratio. The protocol defined and optimised every step of the techniques usually carried out for the analysis of historical mortars, i.e. sampling, sample preparation, assessment of reproducibility and sensitivity of measurements and data treatment. Specimens of mortars were prepared with a calcitic binder, carbonated and analysed by Optical and Electronic Microscopy, Infrared and Atomic Spectroscopy, Thermogravimetry and X Ray Diffraction. The paper presents the preliminary results.