Analytical techniques in art, archaeology and conservation science

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This special issue of *Analytical and Bioanalytical Chemistry* is dedicated to the use of analytical techniques in the field of cultural heritage. It contains a selection from the contributions presented in Berlin during the TECHNART 2011 conference on non-destructive and microanalytical techniques in art and cultural heritage.

The contributions to the conference covered a wide range of advanced X-ray, ion and neutron beam techniques with special emphasis on microanalysis [X-ray fluorescence (XRF), particle-induced X-ray emission (PIXE), X-ray diffraction, scanning electron microscopy–energy-dispersive X-ray analysis] and confocal microscopy (3D micro-XRF, 3D micro-PIXE). Other contributions focussed on Fourier transform IR and Raman microscopy, UV–Vis and near-IR absorption, reflectance and fluorescence methods and other laser-based analytical techniques. Finally, contributions on the use of magnetic resonance spectroscopy, high-performance liquid chromatography and gas chromatography coupled with mass spectrometry, and optical imaging in addition to coherence techniques were also presented. As usual, mobile spectrometry played a major role in the TECHNART conference.

Studies of cultural objects often comprise questions on their origin and dating and attribution to artists or workshops. Sometimes stylistic and art-historical examination coupled with information from contemporary technological treatises and secondary literature may be sufficient to answer such questions.

However, in many cases the missing information can be deduced from the physical and chemical properties of the artefacts. In its individual materiality, each cultural asset is the result of a wide variety of influences (e.g. production,

storage, restoration, preservation). So investigations of physical properties and chemical composition generate important input for answering cultural-historical questions that cannot be solved by historical and philological methods alone. Because of recent technological developments, instrumental diagnostics in art and culture are winning recognition in such fields of transdisciplinary research.

Intimately connected with archaeometric investigations are conservation and restoration studies: the development of reversible restoration or conservation concepts requires knowledge of the material compositions and ageing phenomena of the artefacts.

The growing importance of physical and chemical diagnostics in the field of cultural heritage is reflected in a variety of conferences, workshops and journals. Hence, the dissemination of new developments in analytical technologies is an important prerequisite for further progresses in such a field of transdisciplinary research.

All in all, this special issue represents the state of the art, illustrating how different techniques and different methods can be successfully applied to analytical investigations in the field of cultural heritage. I would like to thank all authors for submitting convincing and newsworthy contributions, all referees for constructive and conducive comments, and finally the central editorial office and the editors for their friendly cooperation.

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