

MATERIALS RESEARCH SOCIETY
SYMPOSIUM PROCEEDINGS VOLUME 852

Materials Issues in Art and Archaeology VII

November 29 – December 2, 2004
Boston, Massachusetts, USA

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-61782-125-7

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2005) by the Materials Research Society
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact the Materials Research Society
at the address below.

Materials Research Society
Proceedings
506 Keystone Dr.
Warrendale, PA 15086

Phone: 724-779-3004 x 531
Fax: 724-779-4396

eproceedings@mrs.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

The Application of Modern Metallurgical Principles And Knowledge to the Manufacture of Mokumé Gane (Wood-Grain Metal) Decorative Alloy	1
<i>Ian T. Ferguson, Brian Derby, G. E. Thompson</i>	
The Development and Manufacture of Aluminium Mokumé Gane (Wood-Grain Metal) Decorative Alloy	8
<i>Ian T. Ferguson, Brian Derby, G. E. Thompson</i>	
Optical Profilometry as a Non-Destructive Technique to Quantify Engraving on Medieval Brass Astrolabes	15
<i>Brian D. Newbury, Michael R. Notis</i>	
A Study of the Materials of Pontormo’s “Portrait of Alessandro de’ Medici”	21
<i>Ken Sutherland, Beth A. Price, Irma Passeri, Mark Tucker</i>	
Fiber Optics Reflectance Spectroscopy in the Entire VIS-IR Range: a Powerful Tool for the Non-invasive Characterization of Paintings	33
<i>M. Bacci, R. Bellucci, C. Cucci, C. Frosinini, M. Picollo, S. Porcinai, B. Radicati</i>	
Confocal X-Ray Fluorescence (XRF) Microscopy: A New Technique for the Nondestructive Compositional Depth Profiling of Paintings	39
<i>Arthur R. Woll, Donald H. Bilderback, Sol Gruner, Ning Gao, Rong Huang, Christina Bisulca, Jennifer Mass</i>	
Atomic Oxygen Treatment and Its Effect on a Variety of Artist’s Media	49
<i>Sharon K. R. Miller, Bruce A. Banks, Deborah L. Waters</i>	
A Parametric Analysis of Relative Humidity Effects on Traditional Panel Paintings	55
<i>Eric Hagan, Evan Quasney, Marion Mecklenburg</i>	
Effects of Water Exposure on the Mechanical Properties of Early Artists’ Acrylic Paints	64
<i>Eric Hagan, Alison Murray</i>	
The Changing Mechanical Properties of Aging Oil Paints	71
<i>Marion F. Mecklenburg, Charles S. Tumosa, David Erhardt</i>	
Linseed Oil Paint as Ionomer: Synthesis and Characterization	83
<i>Charles S. Tumosa, David Erhardt, Marion F. Mecklenburg, Xingfang Su</i>	
An Investigation of the Chemical Changes of Artists’ Acrylic Paint Films When Exposed to Water	90
<i>R. Ploeger, A. Murray, S. Hesp, D. Scarlone</i>	
Using ICP-MS to Detect Inorganic Elements in Organic Materials: A New Tool to Identify Mordants or Dyes on Ancient Textiles	98
<i>Laure Dussubieux, Mary W. Ballard</i>	
The Development of Ultra-Cool Melt Adhesives for Mounting Resin-Coated (RC) Photographic Papers	104
<i>Chris McGlinchey, Bing Yuan</i>	

Solid-State NMR and Resonance Raman Studies of Ultramarine Pigments	114
<i>Eleonora Del Federico, Wolfgang Schoefberger, Rajeev Kumar, Wen Ling, Sofia M. Kapetanaki, Johannes Schelvis, Alexej Jerschow</i>	
Analysis of Stucco Floors from the Citadel of the Archaeological Zone of Teotihuacan, Mexico	122
<i>Luis Torres Montes, Manuel Reyes García, Julie Gazzola, Sergio Gómez</i>	
Estimation of Elastic Constants of Restoration Mortars, Used on Historic Masonries Restoration Interventions, Via Ultrasonic Technique and Correlation to Their Mechanical and Microstructure Parameters	129
<i>Antonia Moropoulou, Asterios Bakolas, Eleni Aggelakopoulou, Anastasia Odatzidou, Christos Teas, Dimitris Papageorgiou</i>	
Producing New Stone Consolidants for the Conservation of Monumental Stones	135
<i>María J. Mosquera, D. M. De Los Santos, A. Montes</i>	
The Role of Microstructure, Nanostructure and Composition in the Brilliant Red Slip of Roman Terra Sigillata Pottery from Southern Gaul	142
<i>Philippe Sciau, Sabrina Relaix, Yolande Kihn, Christian Roucau</i>	
Understanding Bronze Age Faience in Britain and Ireland	148
<i>Alison Sheridan, Katherine Eremín, Andrew Shortland</i>	
The Analysis of Glazed Quartzite Sculpture from Kerma, Capital of Ancient Kush (Sudan)	161
<i>Lisa Ellis, Richard Newman</i>	
Technical Study of Pigments and Paintings in Archaeological Ceramics from Northwestern Argentine Region: An Archaeometric Approach and Implications for Their Conservation Through SEM-EDS	168
<i>Guillermo A. De La Fuente</i>	
The Provenance of Ancient Glass through Compositional Analysis	176
<i>Ian C. Freestone</i>	
Investigations of the Decorative Techniques and Conservation Condition of a Majolica Altar by Andrea della Robbia	190
<i>Michela Ombelli, Costanza Miliani, Assunta Morresi</i>	
Raman μ-Spectrometry, a Unique Tool for On-site Analysis and Identification of Ancient Ceramics and Glasses	198
<i>Ph. Colomban</i>	
Recent Case Studies in the Raman Analysis of Ancient Ceramics : Glaze Opacification in Abbasid Pottery, Medici and 18th Century French Porcelains, Iznik and Kútayha Ottoman Fritwares and an Unexpected Lapis Lazuli Pigment in Lajvardina Wares	213
<i>Ph. Colomban</i>	
Nanoparticles in Lustre Reconstructions	221
<i>P. Fredrickx, J. Verbeek, D. Schryvers, D. Hélyary, E. Darque-Ceretti</i>	

Estimation of Firing Temperature and Compositional Variability of Archaeological Pottery by Differential Scanning Calorimetry	228
<i>A. Giordana, E. Peacock, M. McCarthy, K. Guilbeau, P. Jacobs, J. D. Seger, W. G. Ramsey</i>	
Understanding Glass Deterioration in Museum Collections through Raman Spectroscopy and SIMS Analysis	235
<i>Laurianne Robinet, Katherine Eremin, Sarah Fearn, Colin Pulham, Christopher Hall</i>	
Tomographic Imaging of Nanocrystals by Aberration-Corrected Scanning Transmission Electron Microscopy.....	243
<i>Klaus Van Benthem, Yiping Peng, Stephen J. Pennycook</i>	
Low-Temperature Grain Boundary Diffusion Data Measured from Historical Artifacts	248
<i>R. J. Kremer, M. A. Dayananda, A. H. King</i>	
The Role of βFeOOH in the Corrosion of Archaeological Iron.....	254
<i>David Watkinson, Mark R. T. Lewis</i>	
Electrochemical Techniques Applied to Metals Conservation	266
<i>Virginia Costa</i>	
New Materials on the Renaissance Artists' Palette	273
<i>Barbara H. Berrie, Louisa C. Matthew</i>	
Laser Cleaning of Fifteenth and Early Sixteenth Century A.D. Wax Votive Images from St. Peter's Cathedral, Exeter, England	283
<i>Teresa Moreno</i>	
Protection Efficacy of Fluorinated Acrylic Copolymers Applied on Historical Italian Marbles	293
<i>Tommaso Poli, Lucia Toniolo</i>	
Morphological and Chemical Analyses of Manganese Dioxide Accretions on Mexican Ceramics.....	300
<i>Caitlin R. O'Grady</i>	
Craft Knowledge as an Intangible Cultural Property: A Case Study of Samarkand Tiles and Traditional Potters in Uzbekistan	310
<i>Pamela B. Vandiver</i>	
Author Index	