

# CONTENTS

|                              |       |
|------------------------------|-------|
| <i>List of Figures</i>       | xi    |
| <i>List of Tables</i>        | xix   |
| <i>List of Plates</i>        | xxi   |
| <i>List of Abbreviations</i> | xxiii |
| <i>List of Contributors</i>  | xxv   |

## PART I INTRODUCTION

|                                                                           |   |
|---------------------------------------------------------------------------|---|
| 1. Introduction to the Oxford Handbook of Archaeological Ceramic Analysis | 3 |
| ALICE M. W. HUNT                                                          |   |
| 2. History of Scientific Research                                         | 7 |
| MICHAEL S. TITE                                                           |   |

## PART II RESEARCH DESIGN AND DATA ANALYSIS

|                                                                                      |    |
|--------------------------------------------------------------------------------------|----|
| 3. Designing Rigorous Research: Integrating Science and Archaeology                  | 19 |
| JAUME BUXEDA I GARRIGÓS AND MARISOL MADRID I FERNÁNDEZ                               |    |
| 4. Evaluating Data: Uncertainty in Ceramic Analysis                                  | 48 |
| ROBERTO HAZENFRATZ-MARKS                                                             |    |
| 5. Statistical Modeling for Ceramic Analysis                                         | 58 |
| GULSEBNEM BISHOP                                                                     |    |
| 6. Recycling Data: Working with Published and Unpublished Ceramic Compositional Data | 73 |
| MATTHEW T. BOULANGER                                                                 |    |

## PART III FOUNDATIONAL CONCEPTS

|                          |    |
|--------------------------|----|
| 7. Ceramic Raw Materials | 87 |
| GIUSEPPE MONTANA         |    |

|                                                                                                                                                                    |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 8. Ceramic Manufacture: The <i>chaîne opératoire</i> Approach<br>VALENTINE ROUX                                                                                    | 101 |
| 9. The Organization of Pottery Production:<br>Toward a Relational Approach<br>KIM DUISTERMAAT                                                                      | 114 |
| 10. Provenance Studies: Productions and Compositional Groups<br>YONA WAKSMAN                                                                                       | 148 |
| 11. Mineralogical and Chemical Alteration<br>GERWULF SCHNEIDER                                                                                                     | 162 |
| 12. Formal Analysis and Typological Classification in the Study<br>of Ancient Pottery<br>DANIEL ALBERO SANTACREU, MANUEL CALVO TRIAS,<br>AND JAIME GARCÍA ROSSELLÓ | 181 |
| 13. Fabric Description of Archaeological Ceramics<br>IAN K. WHITBREAD                                                                                              | 200 |
| 14. Analytical Drawing<br>PRABODH SHIRVALKAR                                                                                                                       | 217 |

## PART IV EVALUATING CERAMIC PROVENANCE

|                                                                                                                             |     |
|-----------------------------------------------------------------------------------------------------------------------------|-----|
| 15. Petrography: Optical Microscopy<br>DENNIS BRAEKMANS AND PATRICK DEGRYSE                                                 | 233 |
| 16. Ceramic Micropalaeontology<br>IAN P. WILKINSON, PATRICK S. QUINN, MARK WILLIAMS,<br>JEREMY TAYLOR, AND IAN K. WHITBREAD | 266 |
| 17. Electron Microprobe Analysis (EMPA)<br>CORINA IONESCU AND VOLKER HOECK                                                  | 288 |
| 18. Isotope Analysis<br>BETTINA A. WIEGAND                                                                                  | 305 |
| 19. X-Ray Powder Diffraction (XRPD)<br>ROBERT B. HEIMANN                                                                    | 327 |



20. X-Ray Fluorescence-Energy Dispersive (ED-XRF) and Wavelength Dispersive (WD-XRF) Spectrometry 342  
MARK E. HALL
21. Handheld Portable Energy-Dispersive X-Ray Fluorescence Spectrometry (pXRF) 363  
ELISABETH HOLMQVIST
22. Particle Induced X-ray Emission (PIXE) and Its Applications for Ceramic Analysis 382  
MARCIA A. RIZZUTTO AND MANFREDO H. TABACNIK
23. Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) and Laser Ablation Inductively Coupled Plasma-Mass Spectrometry (LA-ICP-MS) 399  
MARK GOLITKO AND LAURE DUSSUBIEUX
24. Instrumental Neutron Activation Analysis (INAA) in the Study of Archaeological Ceramics 424  
LEAH D. MINC AND JOHANNES H. STERBA
25. Synchrotron Radiation 447  
ALAN F. GREENE

## PART V INVESTIGATING CERAMIC MANUFACTURE

26. Ethnography 469  
KENT D. FOWLER
27. Experimental Firing and Re-firing 487  
MAŁGORZATA DASZKIEWICZ AND LARA MARITAN
28. Fourier Transform Infrared Spectroscopy (FT-IR) in Archaeological Ceramic Analysis 509  
SHLOMO SHOVAL
29. Raman Spectroscopy and the Study of Ceramic Manufacture: Possibilities, Results, and Challenges 531  
JOLIEN VAN PEVENAGE AND PETER VANDENABEELE
30. X-Radiography of Archaeological Ceramics 544  
INA BERG AND JANET AMBERS

31. Organic Inclusions 565  
MARTA MARIOTTI LIPPI AND PASQUINO PALLECCHI

## PART VI ASSESSING VESSEL FUNCTION

32. Formal Typology of Iberian Ceramic Vessels by Morphometric Analysis 585  
ANA LUISA MARTÍNEZ-CARILLO AND JUAN ANTONIO BARCELÓ
33. Mechanical and Thermal Properties 603  
NOÉMI S. MÜLLER
34. Assessing Vessel Function by Organic Residue Analysis 625  
HANS BARNARD AND JELMER W. EERKENS

## PART VII DATING CERAMIC ASSEMBLAGES

35. Typology and Classification 651  
EUGENIO BORTOLINI
36. Direct Dating Methods 671  
SOPHIE BLAIN AND CHRISTOPHER HALL

- Index* 691