

CONTENTS

Introduction.	1
PART I. BASIC RESEARCH, COSMOCHEMISTRY	
Nuclear fission is no invention of humans: The natural reactor of Oklo two billion years ago.	5
<i>A. Kronenberg</i>	
Final destination: Earth.	9
<i>S. Merchel, T Faestermann, U. Herpers, K. Knie, G. Korschinek, P W Kubik</i>	
Chemical characterization of extraterrestrial materials returned from space by mission programmes.	15
<i>M. Ebihara</i>	
Confirmation of the common origin of two meteorites that fell in widely separated locations on the Earth.	19
<i>R. Dybczynski</i>	
Study of the migration behaviour of uranium in reactive barriers.	24
<i>C. Segebade</i>	
Measurement of nanoscale vacancies in materials.	27
<i>Y Ito</i>	
PART II. METHODS AND METHOD VALIDATION	
Laser mass spectrometry.	33
<i>J.V Kratz, N. Trautmann, G. Huber, G. Passler, K. Wendt</i>	
X ray fluorescence.	35
<i>U. Graf</i>	
Advanced X ray fluorescence techniques.	37
<i>D. Wegrzynek, S.A. Bamford, E. Chinea-Cano, A. Markowicz</i>	
Radioisotopes for method validation.	44
<i>V Krivan, M. Rossbach</i>	
Determination of element contents in large samples by prompt yactivation analysis.	48
<i>Y Oura</i>	

PART III. ENVIRONMENTAL APPLICATIONS

Environmental impact assessment of illegal gold mining in the Amazon region.	53
<i>M.B.A. Vasconcellos</i>	
Environmental monitoring programmes: Protecting the community. ..	56
<i>MA.B. C. Menezes</i>	
Persistent organic halogens in environmental materials.	59
<i>M. Kawano</i>	
Neutron activation analysis for organohalogen pollutants in milk and other foodstuffs.	62
<i>Zhifang Chai</i>	
Environmental evaluation of estuarine sediments.	65
<i>M. Matsuo, A. Kuno</i>	
Neutron capture radiography to determine the concentration of natural boron in leaves using the nuclear reaction $^{10}\text{B}(n,\alpha)^7\text{Li}$	68
<i>L.G. Loria Meneses, R. Jimenez Dam</i>	
Large sample instrumental neutron activation analysis for chemical analysis of large quantities of materials in environment related studies.	71
<i>Xilei Un</i>	
Cadmium and other heavy metals in plastics.	76
<i>P Bode</i>	

PART IV. MEDICAL APPLICATIONS

Trace elements in fingernails and toenails for use in cancer research and other health related studies.	85
<i>P Bode</i>	
Breath test to diagnose the presence of <i>Helicobacter pylori</i> , the causative agent of active chronic gastritis and ulcers.	89
<i>MA.B.C. Menezes</i>	
Evaluation of metal concentration in bovine tissues from a region potentially contaminated by metals.	91
<i>MA.B.C. Menezes</i>	
How much iodine is in our diet?	93
<i>J. Kucera</i>	
Instrumental neutron activation analysis as an analytical tool supporting the establishment of guidelines and databases for workers' health awareness programmes	

PART V. INDUSTRIAL APPLICATIONS

Analysis of industrial material with X ray fluorescence.	103
<i>C. Segebade</i>	
Trace contamination in pure high-tech materials.	106
<i>V Krivan, M. Rossbach</i>	
Trace element determinations for advanced material research.	109
<i>P Bode</i>	
(Trace) elements on catalysts in chemical technology.	113
<i>P Bode</i>	
Controlling static charge.	115
<i>G. Gumkowski, U. Graf</i>	
Is it safe to use recycled paper and board packaging in contact with food?	118
<i>D.S.J. Aston, S.J. Parry</i>	
Treating wood with chemical preservatives.	123
<i>G. Kennedy</i>	

PART VI. NON-DESTRUCTIVE TESTING, AND ANALYSIS OF ART OBJECTS

Radioisotope applications for troubleshooting and optimizing industrial processes.	129
<i>J. Thereska</i>	
Traces of Albrecht Durer: Non-destructive analyses of Renaissance silverpoint drawings.	138
<i>I. Reiche, A. Berger, A. Duval, W Gorner, H. Guicharnaud, S. Merchel, M. Radtke, J. Riederer, H. Riesemeier</i>	

PART VII. FORENSIC APPLICATIONS

Bomb pulse radiocarbon dating.	145
<i>C. Tuniz, U. Zoppi, M.A. C. Hotchkis</i>	
Contents of arsenic, mercury and other trace elements in Napoleon's hair determined by INAA using the <i>ko</i> method.	159
<i>Xilei Lin</i>	

PART VIII. ARCHAEOLOGICAL INVESTIGATIONS

Neutron activation analysis applied to archaeological problems.	165
--	-----

Contribution of nuclear analytical techniques to the rescue of Brazilian history through the analysis of ceramics.	171
<i>M.A.B.C. Menezes</i>	
Investigation of antiques with radiation methods.	174
<i>C. Segebade</i>	
Non-destructive analysis of historical silver coins.	177
<i>Z. Kasztovszky</i>	

PART IX. MISCELLANEOUS APPLICATIONS

Characterization of material difficult to homogenize and/or to subsample	183
<i>P Bode</i>	
Inactive tracing using PGNAA	187
<i>Z. Revay</i>	
Vino sin arsenico, por favor (Wine? Yes please. Arsenic? No thanks.). ..	190
<i>A. Chatt</i>	
Contributors to this publication.	195
Subject index.	199
Author index.	203