

# Table of Contents

## Preface

## Chapter 1: Positron Studies of Defects Workshop. Techniques and Instrumentation

### Investigation of In-Flight Annihilation of Positrons Using Coincidence Doppler Broadening Spectroscopy

L. Chryssos and C. Hugenschmidt 3

### Fundamental Experiments with Positronium Confined in Micro-Cavities and Emitted into Vacuum with the New Bunched Positron Beam at the Antimatter Lab of Trento

S. Mariazzi, A. Chehaimi, L. Penasa, R. Caravita and R.S. Brusa 13

### Feasibility of a 'Brightness Booster' for the Intense Slow Positron Source NEPOMUC

J. Mitteneder, G. Kögel, R. Helm, M. Dickmann and G. Dollinger 23

### Development of Slow Positron Beamline Using 30-MeV L-Band LINAC

A. Kinomura, Y. Kawakami, A. Yabuuchi and Q. Xu 37

## Chapter 2: Positron Studies of Defects Workshop. Applications

### Coincidence Doppler Broadening Spectroscopy of Multilayer Graphene on Copper Surface Using a Variable Energy Positron Beam

H. Mahdy, V.A. Chirayath, S. Lotfimaranloo, R.W. Gladen, M. Chrysler, A.J. Fairchild, P. Sau, A.R. Koymen and A.H. Weiss 47

### Applications of Electron-Positron Correlation-Polarization Potential Method to Positron Binding in Glycine Conformers

D. Yoshida, M. Takagi, T. Takayanagi and M. Tachikawa 55

### Positron Studies of Bismuth Donor Centers in Silicon: Effect of Irradiation with 15 MeV Protons

N.Y. Arutyunov, N.V. Abrosimov, M. Elsayed, R. Krause-Rehberg, V.V. Emtsev, G.A. Oganesyan and V.V. Kozlovski 63

### Variability in FeB Pair Association Rates in Silicon under Ultrasound Loading: Effects of Acoustic Wave Types

O. Olikh and N.Y. Arutyunov 69

### Positron Annihilation Lifetime Spectroscopy of Hot-Rolled and Subsequently T4-Treated AlCuMgAg

L. Mathes, L. Heinl, A. Wagner, M. Butterling and C. Hugenschmidt 79

### The S-Phase Formation in a High-Purity Al-Cu-Mg Alloy Monitored by Truncation during Heating-Up

T.E.M. Staab, D. Boras, S. Breitfelder and T. Strobl 87

### Amorphous PbO Photoconductive Film Structure Revealed by Variable-Energy, Doppler-Broadened Positron Annihilation Spectroscopy

J.M. Gaudet, T. Wu, D. Lopez Vilchis, A. Stieh, J. Rado, A. Reznik, A.P. Knights and P. Mascher 103

### Phase Transition and Structural Defects in Complex Iron-Containing Oxide Glasses Probed by Positron Annihilation

T. Kavetskyy, R. Harizanova, P. Petkov, J. Čížek, R. Krause-Rehberg, O. Šauša, B. Zgardzińska, I. Gugov, A. Kiv and C. Rüssel 119

### Advances in Medical Imaging: Will Positron Annihilation Spectroscopy Be the Promise of Preventive Diagnostics

M. Vicini, P. Folegati, R. Ferragut and C. Conci 125

### Melting Front of Ice: What Do the Positrons can Say about it?

I. Stepanov, L.I. Budaeva, O. Raznitsyn, M.V. Karpov and S.V. Stepanov 135

### Ab Initio Calculations of Positron Lifetimes in Diamond: The Bulk, Vacancies and Grain Boundary

M. Dickmann, R. Helm, W. Egger, J. Mitteneder, J.A. Duffek, P. Jarmatz and G. Dollinger 145

**The Positron User Facility at the PULSTAR Nuclear Reactor Applications in Materials Studies and Recent Upgrades**

M. Liu, Y. Akter, A. Bauyrzhan and A. Hawari

155