

EDITORS : M. Watanabe and K. Fukui

CONTENTS

PREFACE

K. Kimura

LIGHT SOURCE

1. Overview of Light Source

T. Kasuga ... 1

2. Suppression of Longitudinal Coupled-Bunch Instability by Decoupling Method

T. Kasuga, H. Yonehara, M. Hasumoto and T. Kinoshita ... 3

3. Bunch Lengthening in Single-Bunch Mode of UVSOR Storage Ring

H. Yonehara, T. Kasuga, M. Hasumoto and T. Kinoshita ... 5

4. Experimental Study of Free-Electron Laser at UVSOR Ring

H. Yonehara, T. Kasuga, T. Kinoshita, M. Hasumoto and Y. Miyahara ... 7

BEAMLINES & EQUIPMENTS

1. Overview of Beam Lines

M. Watanabe ... 9

2. Molecular-Beam Photoionization Apparatus on Beamline BL2B2

K. Kimura, Y. Achiba and H. Shiromaru ... 11

3. Performance of the New Photoionization Apparatus at BL3A2

T. Masuoka, T. Horigome and I. Koyano ... 13

4. Performance of a Dodecapole Collision Chamber for the Study of Ion-Molecule Reactions Using Synchrotron Radiation

S. Suzuki, T. Imamura, I. Koyano and K. Okuno ... 15

5. Construction of a Beam Line for Radiometric Calibration

M. Sakurai, S. Morita, J. Fujita, H. Yonezu, K. Fukui, K. Sakai,
M. Watanabe, E. Nakamura, E. Ishiguro and K. Yamashita ... 17

6. *Diamond Anvil Cell for Far Infrared Spectroscopy under High Pressure*
T. Nanba and M. Watanabe... 19
7. *Delay-Time Modulation Spectroscopy Using a CW Mode-Locked Nd:YAG Laser Synchronized with the SR Pulses*
T. Mitani, H. Okamoto, Y. Takagi, M. Watanabe, K. Fukui,
S. Koshihara and C. Ito ... 21

RESEARCH ACTIVITIES

1. *Vacuum-Ultraviolet Absorption Spectra of CBr₄ and Related Molecules*
I. Tokue, A. Hiraya and K. Shobatake ... 23
2. *Absorption and Fluorescence Cross Sections of Hexachloroethane*
T. Ibuki, A. Hiraya and K. Shobatake ... 25
3. *Formation of NH(*c*¹Π) and NH(A³Π) in the VUV Photolysis of HNCO*
K. Uno, T. Hikida, A. Hiraya and K. Shobatake ... 26
4. *VUV Photoabsorption and Fluorescence Excitation Spectra of Group IIb Organometallics*
T. Ibuki, A. Hiraya and K. Shobatake ... 28
5. *Rydberg Excitations of M(CH₃)₃ in the 106 - 270 nm Region*
T. Ibuki, A. Hiraya, K. Shobatake, Y. Matsumi and M. Kawasaki ... 30
6. *Ionic Fragmentation Processes in Organometallic Molecules of Group II-V Elements Following (n-1)d Core Photoionization*
S. Nagaoka, S. Suzuki, U. Nagashima, T. Imamura and I. Koyano ... 32
7. *Direct Absorption Spectrum of Benzene in a Free Jet*
A. Hiraya and K. Shobatake ... 34
8. *Absorption Spectra of Higher Electronic States of Benzene Clusters in a Free Jet*
A. Hiraya and K. Shobatake ... 36

9. *Experimental Studies on Photoionization Processes of Gaseous Clusters by a Threshold Electron-Photoion Coincidence Technique*
T. Hirayama, S. Nagaoka and K. Kimura ... 38
10. *Autoionization of Superexcited $(O_2)_2$, $(O_2)_3$, and $O_2\text{-Ar}$ Clusters Following VUV Photoexcitation*
M. Ukai, K. Kameta, T. Kamosaki, K. Shinsaka, Y. Hatano,
T. Hirayama, S. Nagaoka and K. Kimura ... 40
11. *Absorption Spectra of Quantum Well Exciton in Alkali Halide Multilayer Structures*
A. Ejiri and K. Nakagawa ... 42
12. *Reflection Spectra of Silica Glass at Low Temperature in the VUV Region*
J. Matsuoka, M. Courbiere, H. Yamanaka,
H. Yamashita and J. Hayakawa ... 44
13. *VUV Optical Properties of SiO_2 Films Deposited by Direct Photo-Excitation CVD*
M. Okuyama, K. Inoue, M. Nakamura and Y. Hamakawa ... 46
14. *Exciton Luminescence in LiBr Crystals*
K. Fujiwara, H. Nishimura, M. Nakayama,
T. Komatsu and S. Hashimoto ... 48
15. *A New Aspect of Intrinsic Luminescence in NaBr and NaI*
K. Kan'no, K. Tanaka, H. Kosaka, T. Mukai, Y. Nakai, M. Itoh,
T. Miyanaga, K. Fukui and M. Watanabe ... 50
16. *New Luminescence Bands Alkali Chlorides Excited with Undulator Radiation at Low Temperature*
K. Fukui, T. Deguchi, M. Fujita, T. Miyanaga, H. Nakagawa,
H. Matsumoto and M. Watanabe ... 52
17. *The Lifetimes of the Auger-Free Luminescence from CsF, CsCl, CsBr, and RbF*
S. Kubota, S. Hashimoto, M. Itoh, J. Ruan and S. Sakuragi ... 54

18. *Threshold Energy for Photogeneration of Self-Trapped Exciton in SiO₂*
K. Tanimura, C. Itoh, N. Itoh and M. Itoh ... 56
19. *VUV Excited Luminescence of Cubic Boron Nitride*
Y. Wada, K. Era and O. Mishima ... 58
20. *Mechanism of Luminescence from CeF₃*
S. Kubota, S. Hashimoto, J. Ruan and S. Sakuragi ... 59
21. *Core Absorption Spectra of Amorphous and Crystalline GeTe Films*
K. Fukui, J. Yamazaki, T. Saito, S. Kondo and M. Watanabe ... 61
22. *EXAFS and XANES Studies of Light Elements Using a New Soft X-Ray Monochromator on BL7A*
I. H. Munro, T. Matsukawa, T. Murata, S. Naoe, M. Henderson,
S. Marshall and S. Gurman ... 63
23. *Total Yield Spectra of Photoelectrons from L-Edge of Germanium*
S. Naoe, T. Murata, K. Fukui and T. Matsukawa ... 65
24. *K-Edge Absorption Spectroscopy of Mg Bearing Minerals*
I. H. Munro, T. Matsukawa, T. Murata, S. Naoe, G. N. Greaves,
M. Henderson and J. Charnock ... 67
25. *Mg K-Edge Absorption Spectra of Magnesium Oxide Species Formed in Mg-Exchanged Y-Type Zeolites*
T. Tanaka, G. Zhang, H. Suzuka, T. Yamaguchi, H. Hattori,
K. Tanabe and T. Murata ... 69
26. *Al K - XANES and EXAFS Studies in Quasicrystals*
M. Mori, T. Ishimasa, K. Ushida and T. Matsukawa ... 71
27. *Local Structure of Amorphous Si_xTe_{1-x} by Si-K EXAFS*
K. Tsunetomo, T. Sugishima, T. Imura and Y. Osaka ... 73
28. *P-K Edge Absorption Spectrum of Potassium Dihydrogenphosphate*
Y. Nishihata and H. Terauchi ... 75

29. *Photoemission Study of Single Crystal $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$*
 T. Takahashi, H. Matsuyama, H. Fujimoto, H. Katayama-Yoshida,
 Y. Okabe, S. Hosoya, K. Seki, M. Sato and H. Inokuchi ... 76
30. *Reflection Spectra of Polydiacetylene with Direct π -Conjugation between
 Polymer Backbone and Side Groups*
 K. Ichimura, H. Nakanishi, H. Matsuda, M. Kato and T. Kobayashi ... 78
31. *Optical Spectra of Polydiacetylene Crystals and Oriented-Films in the UV
 Region*
 T. Kanetake, T. Hasegawa, K. Ishikawa and T. Koda ... 80
32. *Fluorescence of Aromatic Hydrocarbon Crystals. Excitation Spectrum
 and Modulation by Electric Fields*
 R. Katoh, Y. Takeda, Y. Shimizu, H. Kobayashi and M. Kotani ... 82
33. *Fluorescence Excitation Spectra of Some Simple Alkenes in the Vacuum
 Ultraviolet Studied by UVSOR*
 Y. Inoue and T. Okada ... 84
34. *Excitation Transfer in Liquid Cycloalkanes*
 T. Okada, M. Hagihara and K. Kamata ... 86
35. *Photoionization Threshold and Photoionization Yield of Supercritical
 Xenon Doped with TMAE (Tetrakis-Dimethylaminoethylene)
 as a Function of Xenon Density*
 K. Nakagawa, A. Ejiri, R. A. Holroyd, S. Kubota,
 K. Kimura and M. Nishikawa ... 88
36. *Effect of Xenon Density on Structures in Photoconductivity Excitation
 Spectra of Supercritical Xenon Doped with Anthracene*
 K. Nakagawa, A. Ejiri, M. Nishikawa and K. Kimura ... 90
37. *Angle-Resolved Photoemission from Oriented Thin Films of Stearone with
 Synchrotron Radiation : Part II Binding Energy Calibration of
 Photoemission Spectra*
 N. Ueno, K. Seki, N. Sato, H. Fujimoto, K. Sugita and H. Inokuchi ... 92

38. *Photoelectron Spectroscopy of Poly (Dimethylsiloxane)*
T. Sugano, K. Seki, T. Ohta, H. Fujimoto and H. Inokuchi ... 94
39. *Photoemission Spectra of Naphthacene Thin Films*
N. Sato, N. Ueno, H. Fujimoto, K. Seki, K. Sugita and H. Inokuchi ... 96
40. *Angle-Resolved Photoemission from Oriented Thin Films of Poly-Fluoroaluminium Phthalocyanine*
M. Fahy, H. Fujimoto, A. Dann, H. Hoshi, Y. Maruyama,
H. Inokuchi and M. Willis ... 98
41. *Characterization of LB Films Containing Oligothiophenes by Ultraviolet Photoelectron Spectroscopy*
H. Nakahara, J. Nakayama, M. Hoshino, K. Fukuda, H. Fujimoto,
U. Nagashima, H. Inokuchi and K. Seki ...100
42. *Ultraviolet Photoemission Study of Polythiophene Oligomers (II)*
H. Fujimoto, K. Seki, U. Nagashima, H. Nakahara, J. Nakayama,
M. Hoshino, K. Fukuda and H. Inokuchi ...102
43. *Photo-Induced CN^- Production on KCl with Undulator Light*
H. Nakagawa, T. Deguchi, H. Matsumoto, T. Miyanaga, M. Fujita,
K. Fukui and M. Watanabe ...104
44. *Fabrication of Organic Film by SR-CVD*
H. Yamada, M. Nakamura, H. Katoh, T. Hayakawa,
S. Morita and S. Hattori ...106
45. *Synchrotron Radiation-Assisted Etching of Semiconductor Materials. II. Polycrystalline Silicons Using Undulator Light*
K. Shobatake, H. Ohashi, N. Hayasaka, H. Kume and A. Hiraya ...108
46. *Synchrotron Radiation-Assisted Etching of SiO_2 with SF_6 as an Etchant Using Undulator Light*
K. Shobatake, H. Ohashi, N. Hayasaka, H. Kume and A. Hiraya ...110

47. *Degradation of Hydrogenated Amorphous Silicon Films Induced by Irradiation of Synchrotron Radiation*
A. Yoshida, Y. Saito and K. Inoue ...112
48. *Reflectivity Measurements of Cavity Mirrors for VUV-XUV Lasers*
K. Kurosawa, Y. Takigawa and W. Sasaki ...114
49. *Optical Properties of SiO₂ and MgF₂ Cavity Mirrors Irradiated by High Power VUV Laser*
Y. Takigawa, K. Kurosawa and W. Sasaki ...116
50. *Characterization of Multilayer Reflector in 40-150Å Region*
M. Sakurai, K. Yamashita, M. Ohtani, K. Tanaka and M. Kadoh...118
51. *VUV Microscope with Free-Standing Zone Plates at UVSOR*
H. Kihara, Y. Shimanuki, K. Kawasaki, N. Watanabe, M. Taniguchi,
H. Tsuruta, Y. Nagai, Y. Watanabe and S. Ogura ...120
52. *Effect of Pressure on the Interaction-Induced Far-Infrared Absorption of Liquid Carbon Disulfide*
Y. Fujita, T. Ohba and S. Ikawa ...122
53. *Far-Infrared Absorption in Nickel- and Copper Microcrystals*
S. Mochizuki and K. Ishi ...124
54. *Far-Infrared and Millimeter Wave Spectroscopy of Super Ionic Conductors RbAg₄I₅ and KAg₄I₅*
T. Awano, T. Nanba and M. Ikezawa ...126
55. *The Change in the Phonon Spectrum of KI and RbI due to the B1-B2 Phase Transition*
T. Nanba and M. Watanabe ...128

APPENDIX

<i>1. Organization</i>	...131
<i>2. Joint Studies</i>	...132
<i>3. List of Publications</i>	...133
<i>4. Plan View of UVSOR Facility</i>	...136
<i>5. Plan View of UVSOR Storage Ring Associated with Beamlines</i>	...137
<i>6. Intensity Distribution of Synchrotron Radiation from UVSOR</i>	...137
<i>7. Location</i>	...138