

## CONTENTS

### Preface

H.Inokuchi

### 1.Overview of UVSOR Facility

T.Kasuga and M.Watanabe

|  |     |    |
|--|-----|----|
| 1.General Description                    | ... | 1  |
| 2.Light Source                           |     |    |
| 2.1 Overview                             | ... | 3  |
| 2.2 Construction and Commissioning       | ... | 5  |
| 2.3 Performance and Beam Characteristics | ... | 8  |
| 2.4 Undulator and Wiggler                | ... | 10 |
| 3.Measurement Systems                    |     |    |
| 3.1 Beam Lines                           | ... | 11 |
| 3.2 Experimental Equipments              | ... | 12 |
| 4.Building                               | ... | 12 |
| 5.Future Plan                            | ... | 14 |

### 2.Light Source

#### 1.Vacuum System of UVSOR Storage Ring

M.Hasumoto, T.Kasuga, T.Kinoshita and H.Yonehara...15

|  |   |
|--|---|
| 2. Ion-Trapping Effect in Storage Ring |   |
|  | T.Kasuga, H.Yonehara, T.Kinoshita and M.Hasumoto...17         |
| 3. Low Energy Operation                |   |
|  | H.Yonehara, T.Kasuga, M.Hasumoto and T.Kinoshita...19         |
| 4. Undulator                           |   |
|  | H.Yonehara, T.Kasuga, T.Kinoshita, M.Hasumoto and T.Kato...21 |
| 5. Wiggler                             |   |
|  | H.Yonehara, T.Kasuga, T.Kinoshita and M.Hasumoto...23         |

### 3. Measurement Systems

|   |  |
|---|--|
| 1. BL2A Fluorescence Apparatus for Studies of Vapor Phase Photochemistry                      |  |
|   | K.Shobatake, S.Ohshima, A.Hiraya and K.Tabayashi...25                                    |
| 2. Construction of a Supersonic Molecular Beam Apparatus for Beam Line BL2B2                  |  |
|   | Y.Achiba, H.Shiromaru, K.Sato and K.Kimura...27  |
| 3. Status of BL3A1  |  |
|   | M.Watanabe, T.Kato and K.Sakai...29  |
| 4. The TEPSICO-II Apparatus at BL3B for Gas Phase Photo-ionization Studies                    |  |
|   | I.Koyano, K.Tanaka, T.Kato and E.Ishiguro...31   |
| 5. Far-Infrared Spectroscopy of Solid at BL6A1  |  |
|   | T.Nanba, Y.Urashima, M.Ikezawa, M.Watanabe,<br>E.Nakamura, K.Fukui and H.Inokuchi ...33  |
| 6. Plane-Grating Monochromators for $2 \text{ eV} < h\nu < 100 \text{ eV}$ at BL6A2 and BL8B2 |  |
|   | K.Seki, H.Nakagawa, K.Fukui, E.Ishiguro, R.Kato,<br>T.Mori, K.Sakai and M.Watanabe ...35 |

7. Performance of a Double Crystal Monochromator for BL-7A  
of UVSOR  
T.Murata, T.Matsukawa, M.Mori, M.Obashi, S.Nao-e,  
H.Terauchi, Y.Nishihata, O.Matsudo and J.Yamazaki...37
8. The Vacuum-UV Spectrophotometer Installed in the BL-7B  
Beam Line  
T.Horigome, M.Suzui, K.Hayakawa and T.Mitani...39
9. Structure of BL8A  
K.Sakai and M.Watanabe...41

#### 4. Research Activities

1. Isotope Effect on the Fluorescence Cross Section for the  
Dissociative Excitation Processes. I.  $\text{CH}_3\text{CN}$  and  $\text{CD}_3\text{CN}$   
A.Hiraya, S.Ohshima, Y.Matsumoto, K.Tabayashi  
and K.Shobatake ...43
2. Fluorescence from Ion-Pair and Rydberg States of  $\text{I}_2$   
R.J.Donovan, B.V.O'Grady, K.Shobatake and A.Hiraya...45
3. Emission Spectra of  $\text{I}_2$  Excited in Rydberg Region  
A.Hiraya, K.Shobatake and R.J.Donovan...47
4.  $\text{CCl}_2(\tilde{\text{A}}^1\text{B}_1)$  Radical Formation in the VUV Photolyses of  $\text{CCl}_4$   
and  $\text{CBrCl}_3$   
T.Ibuki, A.Hiraya and K.Shobatake...49
5. Absorption and Fluorescence Spectra of  $\text{CH}_3\text{SCN}$  and Related  
Molecules  
I.Tokue, A.Hiraya and K.Shobatake...51
6. Direct VUV Absorption Measurements of Supersonic Cooled  
Molecules and Molecular Clusters  
Y.Achiba, H.Shiromaru and K.Kimura...53

- 7.Photoionization of Methanol Clusters  
N.Washida, Y.Achiba, H.Shiromaru and K.Kimura...55
- 8.Threshold Electron Spectrum and Photoionization Efficiency  
Curve of CH<sub>3</sub>Cl  
S.Suzuki and I.Koyano...57
- 9.Investigation of Deep Valence and Core Level Excitation  
in Volatile Compounds with Group IV Elements Using UVSOR  
S.Nagaoka, S.Suzuki and I.Koyano...59
- 10.Polarized Reflection Spectra of Orthorhombic Indium Bromide  
in 2 - 100 eV Region  
K.Nakamura, Y.Sasaki, M.Watanabe and M.Fujita...61
- 11.Reflection and Luminescence Excitation Spectra of Cadmium  
Halide Crystals  
H.Nakagawa, Y.Shimamoto, H.Matsumoto, M.Fujita,  
T.Miyanaga, K.Fukui and M.Watanabe ...63
- 12.Rare-Earth N<sub>4,5</sub> Absorption Spectra of Some Rare-Earth  
Compounds  
K.Tsutsumi, O.Aita, K.Ichikawa, M.Kamada and M.Okusawa...65
- 13.Time-Resolved Fluorescence Spectroscopy of Molecular  
Exciton in Anthracene Single Crystals  
T.Mitani, T.Yamanaka and I.Yamazaki...67
- 14.Measurement of the Fluorescence Decay Curve Using UVSOR  
Light Pulse  
T.Okada, K.Nakatani and T.Mitani...69
- 15.Measurements of Time Behavior of Tryptophyl Fluorescence  
by Time-Related Single-Photon Counting  
A.Kurita, S.Kinoshita, T.Kushida, Y.Goto,  
K.Hamaguchi and T.Mitani ...71

|   |                |
|---|----------------|
| 16. Photon Stimulated Desorption of Positive Ions from LiF<br>T.Yasue, T.Gotoh, A.Ichimiya, Y.Kawaguchi,<br>M.Kotani, S.Ohtani, Y.Shigeta, S.Takagi,<br>Y.Tazawa and G.Tominaga | ...73          |
| 17. Fabrication of X-Ray Optical Elements by Synchrotron<br>Radiation X-Ray Lithography   | H.Aritome...75 |
| 18. X-Ray Vacuum Lithography<br>M.Hori, H.Yamada, T.Yoneda, S.Morita and S.Hattori...   | 77             |
| 19. X-Ray Topographic Study of p-Chlorobenzamide Single Crystal<br>M.Mori, T.Matsukawa, M.Obashi, T.Murata,<br>S.Nao-e and Y.Nishihata  | ...79          |

#### Appendix

|                         |       |
|-------------------------|-------|
| 1. Organization         | ...81 |
| 2. List of Publications | ...83 |
| 3. Location             | ...84 |