

The 9th TOYOTA RIKEN International Workshop on
New Developments and Prospects for
Future of Mössbauer Spectroscopy (IWMS2018)

Program of IWMS2018

15 Nov. (Thu.)

- 9:30 - Registration
- 10:30 – 10:45 Opening remarks:
N. Kojima (Toyota Physical & Chemical Research Institute, Japan)
- (Chairperson) R. Röhlberger (DESY Hamburg, Germany)
- 10:45 – 11:30 (I-1) Rudolf Ruffer (ESRF, Grenoble, France)
“Historical developments and future perspectives in nuclear resonance scattering”
- 11:30 – 12:20 (O-1) Makoto Seto (Kyoto University, Japan)
“Synchrotron-radiation-based Mössbauer spectroscopy and nuclear resonant quasi-
and inelastic scattering”
(O-2) Ryo Masuda (Kyoto University, Japan)
“⁶¹Ni synchrotron-radiation-based Mössbauer absorption spectroscopy of complex
nanoparticles”
- 12:20 – 13:35 Lunch time
- (Chairperson) M. Seto (Kyoto Univ., Japan)
- 13:35 – 14:20 (I-2) Ralf Röhlberger (DESY Hamburg, Germany)
“Quantum optical phenomena in nuclear resonant scattering”
- 14:20 – 15:05 (I-3) Ilya Sergeev (DESY Hamburg, Germany)
“Nuclear resonance scattering with high energy Mössbauer transitions”
- 15:05 – 15:20 Coffee break
- (Chairperson) Y. Yoshida (Shizuoka Institute of Science and Technology, Japan)
- 15:20 - 16:05 (I-4) Michael Reissner (Institute of Solid State Physics, TU Wien, Austria)
“Mössbauer spectroscopy in external magnetic fields”
- 16:05 – 16:45 (I-5) Naoki Maruyama (Nippon Steel & Sumitomo Metal Co., Japan)
“Mössbauer and atom probe tomography characterization of low and medium carbon
martensitic steels”
- 16:45 – 17:25 (O-3) Ko Mibu (Nagoya Institute of Technology, Japan)
“Mössbauer spectroscopic studies on magnetic thin films”
- 17:25 – 17:50 (O-4) Takashi Segi (Kobelco Research Institute, Inc., Japan)
“Synchrotron radiation-based Ni-61 Mössbauer spectroscopic study of nickel-
supported cathode materials of lithium ion rechargeable battery”
- 17:50 – 18:15 (O-5) Shugo Ikeda (University of Hyogo, Japan)
“Coexistence of superconductivity and antiferromagnetic order in EuFe₂As₂”
- 18:30 – 20:30 Welcome party

IWMS2018 Program (continued)
16 Nov. (Fri.)

- 8:30 - Registration
- (Chairperson) K. Kubo (ICU, Japan)
- 9:00 - 9:45 (I-6) Pierre-Emmanuel Lippens (Institut Charles Gerhardt, Montpellier, France)
“Applications of Mössbauer spectroscopy for Li-ion and Na-ion batteries”
- 9:45 – 10:30 (I-7) Jun Sugiyama (Toyota Central Research & Development Lab., Inc., Japan)
“Energy materials research with muons”
- 10:30 – 10:45 Coffee break
- (Chairperson) P.-E. Lippens (Institut Charles Gerhardt, Montpellier, France)
- 10:45 – 11:25 (I-8) Masashi Okubo (The University of Tokyo, Japan)
“Mössbauer spectroscopy for assessment of battery electrodes”
- 11:25 – 11:50 (O-6) Fumito Fujishiro (Kochi University, Japan)
“Relationship between chemical state of Fe and electrical property in mixed ionic-electronic conductor $\text{Ba}_{1-x}\text{Sr}_x\text{Fe}_{0.9}\text{In}_{0.1}\text{O}_{3-\delta}$ ”
- 11:50 - 13:05 Lunch time
- (Chairperson) Rudolf Rüffer (ESRF, Grenoble, France)
- 13:05 – 13:50 (I-9) Catherine McCammon (University of Bayreuth, Germany)
“Mössbauer spectroscopy with high spatial resolution: spotlight on geoscience”
- 13:50 – 14:15 (O-7) Yoichi Nakajima (Kumamoto University, Japan)
“Inelastic scattering measurements on iron alloys under high pressure: Applications for the nature of planetary cores”
- 14:15 – 14:55 (O-8) Yoshitaka Yoda (JASRI/SPring-8, Japan)
“Present status and biological applications at BL09XU and BL19LXU, SPring-8”
- 14:55 – 15:25 (O-9) Satoshi Tsutsui (JASRI/SPring-8, Japan)
“ ^{149}Sm Mössbauer spectroscopic study on valence fluctuation in Sm intermetallic compounds”
- 15:25 – 15:55 (O-10) Takaya Mitsui (QST/SPring-8, Japan)
“Advanced Mössbauer spectroscopy with nuclear Bragg monochromator in SPring-8”
- 15:55 – 16:10 Coffee break
- 16:10 – 17:00 Poster presentation A (Odd number)
- 17:10 – 18:00 Poster presentation B (Even number)
- 18:30 – 20:30 Banquet

IWMS2018 Program (continued)

17 Nov. (Sat.)

8:30 - Registration

(Chairperson) M. Takahashi (Toho Univ., Japan)

9:00 - 9:45 (I-10) Volker Schünemann (University of Kaiserslautern, Germany)
“From small to large molecules: iron in chemical complexes and biological systems”

9:45 – 10:25 (O-11) Norimichi Kojima (Toyota Physical & Chemical Research Institute, Japan)
“Progress of multifunctional phenomena coupled with spin, photon and charge based on iron mixed-valence system”

10:25 – 10:50 (O-12) Masayuki Nihei (University of Tsukuba, Japan)
“Multi-nuclear cluster as a functional unit of bulk materials”

10:50 – 11:05 Coffee break

(Chairperson) Y. Yoda (JASRI, Japan)

11:05 – 11:30 (O-13) Yasuhiro Ohki (Nagoya University, Japan)
“Iron-based hydride clusters: Synthesis, characterization, and application in the catalytic N₂ silylation”

11:30 – 11:55 (O-14) Takehiro Ohta (University of Hyogo, Japan)
“Structural basis and dynamics for the gas recognition of myoglobin: A nuclear resonance vibrational spectroscopic study”

11:55 - 13:10 Lunch time

(Chairperson) M. Reissner (TU, Wien, Austria)

13:10 – 13:40 (O-15) Makina Saito (Kyoto University, Japan)
”Quasi-elastic scattering experiment using multi-line gamma-ray time-domain interferometry and its various application”

13:40 – 14:20 (O-16) Yutaka Yoshida (Shizuoka Institute of Science and Technology, Japan)
“Mössbauer spectroscopic microscope studies on diffusion in materials”

14:20 – 14:40 Closing remarks/Discussion:
Y. Yoshida (Shizuoka Institute of Science and Technology, Japan)

14:40 – 15:00 Coffee break

15:00 – 17:00 Excursion (Museum Tour)

IWMS2018 Program (continued)

16 Nov. (Fri.)

16:10 – 17:00 Poster presentation A (Odd number)

17:10 – 18:00 Poster presentation B (Even number)

PA-01) Chemical state of Fe in $\text{BaFe}_{1-x}\text{Y}_x\text{O}_{3-\delta}$ and its effect on electrical property -comparison with $\text{Ba}_{1-x}\text{La}_x\text{FeO}_{3-\delta}$ and $\text{BaFe}_{1-x}\text{In}_x\text{O}_{3-\delta}$, T. Hashimoto¹, Y. Matsumoto¹, T. Okiba¹, F. Fujishiro², K. Shozugawa³ and M. Matsuo³, ¹Dept. of Phys., CHS, Nihon Univ., ²Fac. of Sci. and Tech., Kochi Univ., ³Graduate School of Arts and Sci., The Univ. of Tokyo.

PB-02) Spin dynamics in tripyrazolylmethane iron(II) complexes showing static and dynamic spin-crossover phenomena, A. Okazawa¹, H. Kobayashi¹, .I. Kawasaki², I. Watanabe² and N. Kojima³, ¹Graduate School of Arts and Sciences, ¹The University of Tokyo, Japan, ²RIKEN Nishina Center, Japan, ³Toyota Physical and Chemical Research Institute, Japan.

PA-03) Probing orbital angular momentum by Mössbauer and x-ray absorption spectroscopies, J. Okabayashi, Research Center for Spectrochemistry, The University of Tokyo.

PB-04) CEMS study on dilute metal ions doped SnO_2 films prepared by splay pyrolysis, K. Nomura^{1,2}, A. Nakanishi³, N. Naruse³, Y. Mera³, S. Kubuki¹ and Y. Koike², ¹Tokyo Metropolitan University, ²Meiji University, ³Shiga University of Medical Science.

PA-05) ⁵⁷Fe Mössbauer spectroscopic study of spin-crossover complex $\text{Fe}(\text{4methylpyrimidine})_2[\text{Ag}(\text{CN})_2]_2$, K. Kitase¹, M. Takahashi^{1,2} and T. Kitazawa^{1,2}, ¹Department of Chemistry, Toho University, ² Research Centre for Materials with Integrated Properties, Toho University, ³ Shiga University of Medical Science.

PB-06) Interface magnetism of $\text{Co}_2\text{FeGe}/\text{Si}(111)$ layered films prepared by atomically controlled alternate deposition, R. Miyachi, S. Imai, M. A. Tanaka, Y. Hayashi, and K. Mibu, Nagoya Institute of Technology.

PA-07) Development of ⁶¹Ni Mössbauer spectroscopy using KURRI-LINAC, Y. Kobayashi, T. Kubota, R. Masuda, S. Kitao, M. Saito, M. Kurokuzu and M. Seto, Institute for Integrated Radiation and Nuclear Science, Kyoto University.

PB-08) Various Mössbauer source preparation using reactor and electron accelerator, S. Kitao¹, Y. Kobayashi¹, T. Kubota¹, M. Saito¹, R. Masuda¹, M. Kurokuzu¹, S. Hosokawa², H. Tajima², S. Yazaki², and M. Seto¹, ¹Institute for Integrated Radiation and Nuclear Science, Kyoto Univ., ²Graduate School of Science, Kyoto Univ.

PA-09) Development of ¹²⁵Te synchrotron-radiation-based Mössbauer spectroscopy, M. Kurokuzu¹, S. Kitao¹, Y. Kobayashi¹, M. Saito¹, R. Masuda¹, T. Mitsui², Y. Yoda³ and M. Seto¹, ¹Kyoto University Institute for Integrated Radiation and Nuclear Science, ²National Institutes for Quantum and Radiological Science and Technology, ³Japan Synchrotron Radiation Research Institute.

PB-10) Development and application for mobile type nuclear monochromator of 57-iron, K. Fujiwara¹, T. Mitsui², Y. Sakurai³, and N. Ikeda¹, ¹Graduate School of Natural Science and Technology, Okayama Univ. ²National Institutes for Quantum and Radiological Science and Technology (QST), ³Japan Synchrotron Radiation Research Institute (JASRI).

PA-11) Analysis of polymeric gels cross-linked via iron ions by Mössbauer spectroscopy, Y. Kotsuchibashi, R. Yamashita, M. Kobayashi, and Y. Yoshida, Department of Materials and Life Science, Shizuoka Institute of Science and Technology.

PB-12) Electron hopping relaxation in mixed-valence trinuclear iron pentafluorobenzoate complex crystals containing solvent molecules, Y. Sakai¹, T. Nakamoto², R. Ogiso¹, T. Takayama¹, T. Kawasaki³, T. Kitazawa³, and M. Takahashi³, ¹Department of Chemistry, Daido University, ²Toray Research Center, ³Department of Chemistry, Toho University.

PA-13) Anomalous behavior of the magnetization at the surface of Fe₃O₄(100), T. Kawauchi¹, K. Asakawa², and K. Fukutani¹, ¹Institute of Industrial Science, The University of Tokyo, ²The Institute of Solid State Physics, The University of Tokyo.

PB-14) Antimony-121 Mössbauer spectrum of Sb(V) n-confused porphyrin complex, M. Takahashi, K.-N. Wada, T. Kobayashi, and S. Matsukawa, Faculty of Science, Toho University.

PA-15) Local structure and electrocatalytic properties of conductive vanadate glass applied to metal-air rechargeable battery, N. Oka, H. Miyamoto, Y. Fujita, S. Masuda, M. Yuasa, and T. Nishida, Department of Biological and Environmental Chemistry, Kinki University.

PB-16) A new Mössbauer spectroscopic camera, M. Kobayashi and Y. Yoshida, Shizuoka Institute of Science and Technology.

PA-17) Mössbauer spectroscopic microscope observations of cutting and grinding induced defects on metallic mold, R. Atsumi, M. Yasuda, Y. Yoshida, A. Goto and H. Fujiwara, Shizuoka Institute of Science and Technology.

PB-18) An imager data analysis for MCS diffusion studies, S. Hattori, H. Ohba, S. Mizuno, M. Kobayashi, and Y. Yoshida, Shizuoka Institute of Science and Technology.

PA-19) Dynamical study of Na-P-S superionic conducting glasses by gamma-ray quasi-elastic scattering experiments, S. Yazaki¹, M. Saito¹, Y. Onodera¹, M. Kurokuzu¹, Y. Yoda² and M. Seto¹, ¹Kyoto University, ²Japan Synchrotron Radiation Research Institute.

PB-20) Synchrotron radiation-based Ni-61 Mössbauer spectroscopic study of nickel-supported cathode materials for lithium ion rechargeable batteries, T. Segi¹, R. Masuda², Y. Kobayashi², T. Tsubota¹, Y. Yoda³ and M. Seto², ¹Kobelco Research Institute, Inc., ²Institute for Integrated Radiation and Nuclear Science, Kyoto University, ³Research and Utilization Division, Japan Synchrotron Radiation Research Institute.

PA-21) Study on the structural evolution of thiolate-protected gold clusters by means of ¹⁹⁷Au Mössbauer spectroscopy, N. Kojima¹, Y. Kobayashi², M. Seto², Y. Negishi³, T. Tsukuda⁴, ¹Toyota Physical and Chemical Research Institute, ²Institute for Integrated Radiation and Nuclear Science, Kyoto University, ³Faculty of Science Division I, Tokyo University of Science, ⁴Department of Chemistry, School of Science, The University of Tokyo.

PB-22) Wet chemical synthesis of aluminum-iron oxide nanocomposite, H. Ito¹, N. Nishida¹, Y. Kobayashi^{2,3}, Y. Yamada¹, ¹Department of Chemistry, Tokyo University of Science, ²Department of Engineering Science, The University of Electro-Communications, ³Nishina Center for Accelerator-Based Science, RIKEN.

PA-23) Benchmarking of density functional theory with Mössbauer isomer shift and the application to f-block metal coordination chemistry, M. Kaneko, M. Watanabe, Nuclear Science and Engineering Center, Japan Atomic Energy Agency.

PB-24) Platform for 3d Mössbauer spectroscopic microscope, K. Ogai¹, K. Moriguchi¹, Y. Ino², K. Hayakawa³ and Y. Yoshida³, ¹APCO Ltd., ²AIST(FREA), ³Shizuoka Institute of Science and Technology.

PA-25) Metastable iron carbides: Elementary condensations for a deeper understanding of the Fe-C system, F. Miani¹, F. Maurigh², ¹University of Udine, Italy, ²ABS Acciai, Italy.