Dr. Susumu Yamamoto

Stanford Synchrotron Radiation Laboratory
2575 Sand Hill Road, Menlo Park, CA 94025, USA.
Phone: +1-650-926-5586
Fax: +1-650-926-4100
susumu@slac.stanford.edu
http://www-ssrl.slac.stanford.edu/~susumu/susumu_index.html

Education

Ph.D. in Chemistry University of Tokyo, Tokyo, Japan, March 2005
Supervisor: Prof. Jun Yoshinobu
Thesis title: Structure and Reaction of Water Ice on Rh(111)

B.Arts in Chemistry International Christian University, Tokyo, Japan, March 2000

Research Experience

Apr 2005 – present **Postdoctoral Reseacher**
Stanford Synchrotron Radiation Laboratory, Stanford, CA, USA.
Supervisor: Prof. Anders Nilsson

- Utilized synchrotron-based Ambient Pressure X-ray Photoelectron Spectroscopy for *in situ* characterization of gas-solid and gas-liquid interfaces under ambient conditions at the beamline 11.0.2 of Advanced Light Source. Special focus was on water adsorption and chemistry on various surfaces (metals and metal oxides).
- Studied the interaction of water with thin-film oxide surfaces and hydrophobic surfaces in ultrahigh vacuum, using X-ray Photoelectron Spectroscopy, X-ray Absorption Spectroscopy at the beamline 5-1 of Stanford Synchrotron Radiation Laboratory.

Apr 2002 – Mar 2005 **Graduate Research Assistant**
University of Tokyo, Tokyo, Japan.
Supervisor: Prof. Jun Yoshinobu

- Investigated the formation process and morphology of thin water ice film on a single crystal metal surface using Infrared Reflection Absorption Spectroscopy.
- Explored low-energy electron-induced chemical reactions in water ice.
- Developed the ultrahigh vacuum system that enables Infrared Reflection Absorption Spectroscopy at a liquid helium temperature. Performed calibration, designed and machined parts to upgrade the system.
- Participated in the synchrotron-based experiments to study the adsorbed states of organic molecules on silicon surfaces and the valence band structure at the silicon/slicon oxide interface, using X-ray Photoelectron Spectroscopy, X-ray Absorption Spectroscopy, and X-ray Emission Spectroscopy at Photon Factory at Tsukuba, Japan, and SPring-8 at Hyogo, Japan.

Honors and Awards

2004 Student Prize of The 5th Surface Electronics Workshop
2004 Student Travel Award from University of Tokyo

Publications

Peer-Reviewed Journal Publications:

[1] **S. Yamamoto**, H. Bluhm, K. Andersson, G. Ketteler, H. Ogasawara, M. Salmeron, and A. Nilsson,
"*In-situ* X-ray photoemission spectroscopy studies of water on metals and metal oxides",
J. Phys.: Condens. Matter, in press (2007). (**Invited paper**)

[2] K. Andersson, G. Ketteler, H. Bluhm, **S. Yamamoto**, H. Ogasawara, L. G. M. Pettersson, M. Salmeron, and A. Nilsson,
"Auto-catalytic water dissociation on Cu(110) at near ambient conditions",
J. Am. Chem. Soc., submitted (2007).

[3] K. Andersson, G. Ketteler, H. Bluhm, **S. Yamamoto**, H. Ogasawara, L. G. M. Pettersson, M. Salmeron, and A. Nilsson,
"Bridging the Pressure Gap in Water and Hydroxyl Chemistry on Metal Surfaces: the Cu(110) case",
J. Phys. Chem. C, **111**, 14493-14499 (2007).

[4] G. Ketteler, **S. Yamamoto**, H. Bluhm, K. Andersson, D. E. Starr, D. F. Ogletree, H. Ogasawara, A. Nilsson, and M. Salmeron,
"The Nature of Water Nucleation Sites on TiO_2(110) Surfaces Revealed by Ambient Pressure X-ray Photoelectron Spectroscopy",
J. Phys. Chem. C **111**, 8278-8282 (2007).

[5] **S. Yamamoto**, K. Andersson, H. Bluhm, G. Ketteler, D. E. Starr, T. Schiros, H. Ogasawara, L. G. M. Pettersson, M. Salmeron, and A. Nilsson,
"Hydroxyl-Induced Wetting of Metals by Water at Near Ambient Conditions",
J. Phys. Chem. C (Letters) **111**, 7848-7850 (2007).

[6] A. Beniya, **S. Yamamoto**, K. Mukai, Y. Yamashita, and J. Yoshinobu,
"The first layer of water on Rh(111): Microscopic structure and desorption kinetics",
J. Chem. Phys. **125**, 054717 (2006).

[7] Y. Yamashita, **S. Yamamoto**, K. Mukai, J. Yoshinobu, Y. Harada, T. Tokushima, T. Takeuchi, Y. Takata, S. Shin, K. Akagi, and S. Tsuneyuki,
"Direct observation of the site-specific valence electronic structure at SiO_2/Si interface",
e-Journal of Surface Science and Nanotechnology **4**, 280-284 (2006).

[8] Y. Yamashita, **S. Yamamoto**, K. Mukai, J. Yoshinobu, Y. Harada, T. Tokushima, Y. Takata, and S. Shin,
"Effects of interface roughness on the local valence electronic structure at SiO_2/Si interface: Soft X-ray absorption and emission study",
Journal de Physique IV **132**, 259-262 (2006).

[9] Y. Yamashita, **S. Yamamoto**, K. Mukai, J. Yoshinobu, Y. Harada, T. Tokushima, T. Takeuchi, Y. Takata, S. Shin, K. Akagi, and S. Tsuneyuki,
"Direct Observation of Site-specific Valence Electronic Structure at Interface: SiO_2/Si Interface",
Phys. Rev. B **73**, 045336 (2006).

[10] **S. Yamamoto**, A. Beniya, K. Mukai, Y. Yamashita, and J. Yoshinobu,
"Water adsorption on Rh(111) at 20 K: from monomer to bulk amorphous ice",
J. Phys. Chem. B **109**, 5816-5823 (2005).

[11] **S. Yamamoto**, A. Beniya, K. Mukai, Y. Yamashita, and J. Yoshinobu,
"Low-Energy Electron-Stimulated Chemical Reactions of CO in Water Ice",
Chem. Phys. Lett. **388/4-6**, 384-388 (2004).

[12] Y. Yamashita, S. Machida, M. Nagao, **S. Yamamoto**, K. Mukai, and J. Yoshinobu,
"Vibrational structure in C1s photoelectron spectra of ethylene on the Si(100)(2×1) surface",
Chem. Phys. Lett. **374**, 476-481 (2003).

[13] S. Machida, M. Nagao, **S. Yamamoto**, Y. Kakefuda, K. Mukai, Y. Yamashita, and J. Yoshinobu,
"Electronic states and chemical reactivity of Si(100)c(4×2) surface at low temperature studied by high resolution Si 2p core level photoelectron spectroscopy",
Surf. Sci. **532/535**, 716-720 (2003).

[14] Y. Yamashita, S. Machida, M. Nagao, **S. Yamamoto**, Y. Kakefuda, K. Mukai, and J. Yoshinobu,
"Direct Evidence for Asymmetric Dimer on Si(100) at Low Temperature by means of High Resolution Si 2p Photoelectron Spectroscopy",
Jpn. J. Appl. Phys. **41**, L272-L274 (2002).

Other Publications:

[1] J. Yoshinobu, **S. Yamamoto**, H. Okuyama,
"Physical properties and chemical reactions on ice surfaces studied by vibrational spectroscopy",
OYO-BUTSURI 73, 1307-1311 (2004). (in Japanese) [Short review]

[2] H. Ogasawara, **S. Yamamoto**,
"Synchrotron radiation, XAS, XES",
The Fifth Series of Experimental Chemistry, Vol. 24 Surface and Interface, p.158-178,
(edited by The Chemical Society of Japan, Maruzen, 2007). (in Japanese) [Textbook]

References

Prof. Jun Yoshinobu
The Institute for Solid State Physics, University of Tokyo
5-1-5 Kashiwanoha, Kashiwa, Chiba 277-8581, Japan.
Phone: +81-4-7136-3320
yoshinobu@issp.u-tokyo.ac.jp

Prof. Anders Nilsson
Stanford Synchrotron Radiation Laboratory
2575 Sand Hill Road, Menlo Park, CA 94025, USA.
Phone: +1-650-926-2233
nilsson@slac.stanford.edu

Prof. Lars G.M. Pettersson
FYSIKUM, Stockholm University
AlbaNova University Center, SE-106 91 Stockholm, Sweden.
Phone: +46-8-553 787 12
lgm@physto.se

Prof. Mischa Bonn
FOM Institute for Atomic and Molecular Physics
Kruislaan 407, 1098 SJ, Amsterdam, The Netherlands.
Phone: +31-20-6081234
bonn@amolf.nl