



INTERNATIONAL INSTITUTE FOR CARBON-NEUTRAL ENERGY RESEARCH

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**-VARIOUS ASPECTS OF HYDROGEN-RELATED PROCESSES AT  
TRIBO-INTERFACES-**

**2018 HYDROGENIUS AND I²CNER TRIBOLOGY SYMPOSIUM**

**I²CNER HYDROGEN MATERIALS COMPATIBILITY DIVISION  
& HYDROGENIUS TRIBOLOGY DIVISION**

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**DATE: FRIDAY, FEBRUARY 2, 2018**

**TIME: 10:00 AM-6:00 PM**

**VENUE: LECTURE ROOM, 3F, SHIKI HALL**

Time	Speaker	Affiliation	Title
10:00-10:05	Joichi Sugimura	Kyushu University	Opening Remarks
10:05-11:55 Session 1 Chairperson: Yoshinori Sawae, Kyushu University			
10:05-10:45	Géraldine Theiler	BAM, Germany	<i>Keynote Lecture</i> Tribology of Polymers Materials in Cryogenic Hydrogen and Methane
10:45-11:10	Naofumi Kanei	Kobe Steel, Ltd.	<i>Invited Talk</i> Technological trends of high pressure hydrogen compressor - Approach of KOBELCO Group -
11:10-11:35	Go Tatsumi <sup>1</sup> , Yuji Shitara <sup>1</sup> , Peng Yao <sup>2</sup> , Toshiaki Wakabayashi <sup>2</sup>	<sup>1</sup> JXTG Nippon Oil & Energy Corporation, <sup>2</sup> Kagawa University	<i>Invited Talk</i> Influences of sulfur-containing additives on grease decomposition and hydrogen generation by nascent metal surface
11:35-11:55	Vlad B. Niste, Hiroyoshi Tanaka, Joichi Sugimura	Kyushu University	<i>Invited Talk</i> Inhibiting hydrogen permeation in bearing steel by controlling tribofilm growth in the contact
11:55-12:50	Lunch		

12:50-2:45 Session 2  
Chairperson: Kanao Fukuda, Universiti Teknologi Malaysia

12:50-1:30	Ali Erdemir	Argonne National Laboratory, USA	<i>Keynote Lecture</i> The role of hydrogen in carbon tribology: A mechanistic overview
1:30-1:55	Shinya Sasaki, Hiharu Okubo	Tokyo University of Science, Japan	<i>Invited Talk</i> Super-low friction mechanism of diamond-like carbon lubricated with an environmentally friendly ester based oil
1:55-2:20	Yusuke Ootani	Tohoku University, Japan	<i>Invited Talk</i> Tribochemical wear of silicon-based materials mediated by proton transfer: Molecular dynamics sliding simulation analysis
2:20-2:45	Satoru Maegawa	Tottori University, Japan	<i>Invited Talk</i> Visualization of real contact area of rubber materials sliding on hard substrates
2:45-3:00	Coffee Break		
<b>3:00-4:25 Joint Symposium of Hydrogen Tribology Team and Hydrogen Polymers Team</b> Chairperson: Dr. Neha RUSTAGI, Fuel Cell Technologies Office, DOE, USA			
3:00-3:40	Dr. Kevin Simmons	Pacific Northwest National Laboratory, USA	<i>Invited Talk</i> Hydrogen Compatible Polymeric Materials
3:40-4:20	Joichi Sugimura	Kyushu University	Tribology of rubbers in hydrogen
4:20-4:25	Prof. Shin Nishimura	Kyushu University	Closing Remarks of Oral Session
4:25-4:30	Coffee Break		

4:30-6:00 **Poster Session**

PT 01	Hikaru Okubo, Shinya Sasaki	Tokyo University of Science, Japan	Frequency modulation atomic force microscopy (FM-AFM) observation of adsorbed films on diamond-like carbon (DLC) surfaces
PT 02	Prabakaran Saravanan, Roman Selyanchyn, Hiroyoshi Tanaka, Joichi Sugimura	Kyushu University	Tribology of polyethylenimine / molybdenum disulphide (PEI/MoS <sub>2</sub> ) <sub>15</sub> films in dry atmospheres
PT 03	Kohei Shirahama <sup>1</sup> , Hiroyoshi Tanaka <sup>1</sup> , Takeshi Maeda <sup>2</sup> , Joichi Sugimura <sup>1</sup>	<sup>1</sup> Kyushu University, <sup>2</sup> Kyocera Corporation, Japan	Effect of environmental gas on friction and wear of various ceramics
PT 04	Keisuke Manabe, Hiroyoshi Tanaka, Joichi Sugimura	Kyushu University	Effects of oxygen and water on friction and wear of DLC slid against pure metals
PT 05	Naotoshi Shimizu <sup>1</sup> , Yoshinori Sawae <sup>2</sup> , Takehiro Morita <sup>2</sup> , Shugo Onitsuka <sup>2</sup> , Joichi Sugimura <sup>2</sup>	<sup>1</sup> IHI Corporation, <sup>2</sup> Kyushu University	Friction and wear of polymer composites in hydrogen environment at low temperature
PT 06	Reona Umei, Keiji Sakaki, Takehiro Morita, Yoshinori Sawae, Joichi Sugimura	Kyushu University	Effect of trace moisture content on low friction mechanism of carbon fiber filled PTFE in high purity hydrogen
PT 07	Yoshinori Sawae, Eiichi Miyakoshi, Shunichiro Doi, Takehiro Morita, Joichi Sugimura	Kyushu University	Friction and wear of polymer composites in high pressure hydrogen
PT 08	Shotaro Koizumi <sup>1</sup> , Hiroyoshi Tanaka <sup>1</sup> , Yuuya Hayashi <sup>2</sup> , Naruhiko Inayoshi <sup>2</sup> , Joichi Sugimura <sup>1</sup>	<sup>1</sup> Kyushu University, <sup>2</sup> DENSO Corporation, Japan	Effects of environmental gases on friction and wear of stainless steels
PT 09	Daisuke Takekawa <sup>1</sup> , Yoji Sunagawa <sup>1</sup> , Hiroyoshi Tanaka <sup>2</sup> , Joichi Sugimura <sup>2</sup>	<sup>1</sup> Idemitsu Kosan Co., Ltd., <sup>2</sup> Kyushu University	Hydrogen generation from cyclic compounds in rolling contact of steel
PT 10	Hiromitsu Kakudo, Satoshi Takada, Makoto Yoshida	Japan Aerospace Exploration Agency, Japan	Evaluation of new type bearing retainer for liquid rocket engine turbopump