

# CAMPUS Asia EEST 18<sup>th</sup> Cross Straits Symposium

Dec 4<sup>th</sup> – 6<sup>th</sup>, 2016, Shanghai Jiao Tong University

---

Under the Concept of Global Human Resource Development Focusing on the East Asian Region, Governments of China, Japan and Korea have agreed to establish “China-Japan-Korea Committee for Promoting Exchange and Cooperation among Universities” and initiated the CAMPUS Asia (Collective Action for Mobility Program of University Students in Asia) program. The CAMPUS-Asia EEST which stands for ‘Collaborative Graduate School Program for Global Human Resources Development in Energy and Environmental Science and Technology’ was approved to be launched in 2011, and was granted as one of the formal projects in 2016. CAMPUS-Asia EEST enables students from Shanghai Jiao Tong University (SJTU, China), Kyushu University (KU, Japan) and Pusan National University (PNU, Korea) to pursue a double degree in related fields. Besides, three academic activities are also carried out annually at the three universities, namely the Spring Seminar, Summer School, and Cross Straits Symposium, which encourage non-double degree students to participate and benefit from the CAMPUS Asia project as well.

The 18th CSS will be held in Shanghai Jiao Tong University from Dec 4<sup>th</sup> to Dec 6<sup>th</sup>, 2016. The symposium includes 4 Keynote speeches, 30 oral presentations, and 100 poster presentations, which will be given by the professors and Ph D students from the three universities. The schedule is shown below and all students/professors are welcome to participate.

## 18<sup>th</sup> CSS-EEST – Shanghai Jiao Tong University – 4-6 December 2016

Dec 4<sup>th</sup>, 2016

Time	Schedule
13 : 30	<b>Registration (Chen Ruiqiu 100)</b>
14 : 00 – 14 : 20	<b>Welcome/Guest Speeches (Chen Ruiqiu 100)</b> <b>Chair: YANG Shengrong</b>
14 : 20 – 14 : 30	<b>Group Photo</b>
<b>Keynote Speeches I (Chen Ruiqiu 100) Chair: Prof. CAO Xinde</b>	
14 :30 – 15 : 00	<b>Prof. Peng Zhang-SJTU</b> Investigation of clathrate hydrate for cold energy storage
15 :00 – 15 : 30	<b>Prof. Seigi Mizuno-KU</b> Growth of Si <sub>4</sub> O <sub>5</sub> N <sub>3</sub> Single Layer on SiC(0001) in Ultra-High Vacuum and Structure Determination Using Low-Energy Electron Diffraction
15 : 30- 16 : 00	<b>Coffee Break</b>
<b>Keynote Speeches II (Chen Ruiqiu 100) Chair: ZHANG Peng</b>	
16 : 00 – 16 : 30	<b>Prof. Gyungmin Choi-PNU</b> Correlation between the Electrochemical Reaction and Fuel Characteristic in Direct Carbon Fuel Cell System
16 : 30 – 17 : 00	<b>Prof. Xinde Cao-SJTU</b> The current situation and challenge of the brownfield remediation in China

**Dec 5<sup>th</sup>, 2016**

<b>9:00 - 10:15</b>	<b>Parallel Sessions (Materials, Energy, Environment)</b>
<b>10:15 - 10:30</b>	<b>Coffee Break</b>
<b>10:30 - 11:45</b>	<b>Parallel Sessions (Materials, Energy, Environment)</b>
<b>12:00- 13:30</b>	<b>Lunch (No. 2 Canteen)</b>
<b>13:30-14:45</b>	<b>Parallel Sessions (Materials, Energy, Environment)</b>
<b>14:45-15:00</b>	<b>Coffee Break</b>
<b>15:00 - 17:00</b>	<b>Poster Session</b>
<b>17:00 - 17:30</b>	<b>Closing Session      Chair: YANG Shengrong</b>

**Dec 6<sup>th</sup>, 2016**

Site visiting.

**Dec 7<sup>th</sup>, 2016**

Departure.

**Dec 5<sup>th</sup>, 2016. Materials Session. Room 117, Chen Ruiqiu Building.**

<b>Index</b>	<b>Time</b>	<b>Speaker</b>	<b>Title</b>
1	9:00-9:12	Maoshu YIN	C18 Annealing-free perovskite films by instant crystallization for efficient solar cells
2	9:12-9:24	HWANG TaeWoo	C13 Effect of nitrogen concentration on crack-susceptibility during direct laser melting process
3	9:24-9:36	Tomomi Takahashi	C06 Fabrication of porous thin film with opal structure using mono-dispersed CeO <sub>2</sub> particles
4	9:36-9:48	JO Seung-Hyeon	C15 Synthesis and physico-chemical activity of nano-sized ceria on a-CeTiO <sub>x</sub> for low temperature SCR
5	9:48-10:00	Shin Sakiyama	C02 Polymer homo junction diode fabricated by dilute solution
6	10:00-10:12	Satoshi Takeichi	C03 Thermal conduction evaluation of ultrananocrystalline diamond/hydrogenated amorphous carbon composite films by time-domain thermoreflectance
7	10:30-10:42	Chao CHANG	C19 Efficient Solar-Thermal Energy Harvest Driven by Interfacial Plasmonic Heating-Assisted Evaporatio
8	10:42-10:54	M L Palash	C11 Topographic analysis of silica gel imaged with atomic force microscopy
9	10:54-11:06	PARK Cheolho	C14 Interpretation of diffusible hydrogen with respect to grain size using in situ slow strain rate test and thermal desorption spectrometry
10	11:06-11:18	Shogo Takeuchi	C04 Synthesis of Electro-Optic Side-Chain Polymers with Medium-Sized Cycloalkyne Chromophores via the Catalyst-Free Huisgen Reaction
11	11:18-11:30	SHIN Byung-Hyun	C16 Effect of cooling rate on growth of secondary phase in Super Duplex Stainless Steel UNS S 32750
12	11:30-11:42	Shinji Hirata	C05 Synthesis and thermoelectric properties of nanoporous oxide composites containing metal nanoparticles
13	11:42-11:54	Lina CHONG	C20 Synthesis and characterization of nano-encapsulated hydride for hydrogen storage
14	13:30-13:42	HIMANSHU	C17 A Study of Different Geometry Core Patterns for Transformer
15	13:42-13:54	Rezwan Ahmed	C01 Fabrication of spin valve junctions comprising Fe <sub>3</sub> Si/B-doped carbon/Fe trilayers
16	13:54-14:06	Tomoki Oda	C07 Achievement of low parasitic resistance in Ge n-MOSFET with embedded tin-source/drain structure

17	14:06-14:18	Chisato Motoyama	C08	Effect of n-type doping level on direct band gap light emission intensity for asymmetric metal/Ge/metal diodes
18	14:18-14:30	Hiroataka Iwashita	C09	The junction between an n-doped polymer semiconductor and an electrode
19	14:30-14:42	Kazutoshi Nakashima	C10	Spin valves comprising nitrogen-doped carbon interlayers
20	14:42-14:54	Kosuke Nakamoto	C12	Aqueous sodium-ion battery with concentrated electrolyte

**Dec 5<sup>th</sup>, 2016. Environment Session. Room 114, Chen Ruiqiu Building.**

<b>Index</b>	<b>Time</b>	<b>Speaker</b>	<b>Title</b>
1	9:00-9:15	Zhe WANG	H10 One-step synthesis of magnetic core/zirconia shell nanocomposite for high efficiency removal of phosphate from water
2	9:15-9:30	SON Taewan	H05 Aerodynamic focusing of 30nm–10 $\mu$ m aerosol particles: simulation & experimental demonstration
3	9:30-9:45	Satoru Akiyama	H01 Preparation of silica glass by sintering and its transmittance properties
4	9:45-10:00	Ming CHEN	H15 Transport and retention of biochar nanoparticles in natural soil: role of ionic strength and humic acid
5	10:00-10:15	T. N.V. Krishna	H06 Speed control of stepper motors with matlab and arduino
6	10:30-10:45	Yoshihiro Nishimura	H02 Multi-spacecraft analysis of magnetohydrodynamic turbulence in space plasma environment
7	10:45-11:00	Junjie AO	H12 Simultaneous determination of triclosan, bisphenol-a, and four commonly used organic uv filters in indoor dust by accelerated solvent extraction and gas chromatography-tandem mass spectrometry
8	11:00-11:15	GOVINDU Sarat	H07 A solar/grid connected system with MPPT switching
9	11:15-11:30	Yutaro Torigoe	H03

10	11:30-11:45	Pingru SU	H13	QSAR models for removal rates of organic pollutants adsorbed by in situ formed manganese dioxide under acid condition
11	13:30-13:45	Wei CHEN	H11	Life cycle assessment of cement production in china
12	13:45-14:00	SRINIVASA Rao Sunkara	H08	Influence of nickel content in coxniys nanoparticles as an efficient catalyst and its applications in solar and fuel cells
13	14:00-14:15	Kamra M. Mohamed	H04	Numerical simulation of two phase flow past an obstacle using umthinc
14	14:15-14:30	Taiyang ZHANG	H14	Facile fabrication of large-grain $\text{CH}_3\text{NH}_3\text{PbI}_{3-x}\text{Br}_x$ films for high-efficiency solar cells via $\text{CH}_3\text{NH}_3\text{Br}$ selective Ostwald ripening
15	14:30-14:45	YUN Doyun	H09	Effect of Accelerated Carbonation on the Strength Development of MgO-Based Binder

**Dec 5<sup>th</sup>, 2016. Energy Session. Room 121, Chen Ruiqiu Building.**

Index	Time	Speaker	Title	
1	9:00-9:15	CANBIN HUANG	N01	Study of steady-state operation and ELM control in tokamak
2	9:15-9:30	YANUAR Yudhi Isworo	N10	Sub bituminous coal-biomass blending combustion evaluation using thermogravimetric (TGA) and Petrographic Analysis
3	9:30-9:45	Jishen JIANG	N12	Finite element analysis of the failure of thermal barrier coatings
4	9:45-10:00	ZHENGXING WANG	N02	Study of the colorimetry on the in-situ measurement of the deposition thickness in QUEST tokamak
5	10:00-10:15	GHOLAMREZA Bamorovat Abadi	N08	Simulation of transient behaviour of phase-change evaporators
6	10:30-10:45	Amr Mohamed Abdelhamid Mohamed HALAWA	N03	Aerodynamic performance validation of du96-w180 wind turbine airfoil
7	10:45-11:00	Yao ZHANG	N14	High-performance cathode materials of $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$ for lithium ion batteries

8	11:00-11:15	SUNG Taehong	N09	Development of 200-kw organic rankine cycle for waste heat recovery of steel processing plant
9	11:15-11:30	Amr Mohamed Metwally ISMAIEL	N04	Verification of equivalent isotropic model for a composite hawt blade
10	11:30-11:45	Ke LI	N13	Catalytic combustion of lean methane assisted by electric field over Pd-Ce-Zr catalyst at low temperature
11	13:30-13:45	ZHAO Zhi-jun	N07	Effects of Different Nanoimprint Resins as Mold Substrates on Silver nanowires Morphology and Properties
12	13:45-14:00	Tarek Naem Mohamed DIEF	N05	System Identification And Control Of Airborne Kite Power System
13	14:00-14:15	Zihao ZHANG	N15	Catalytic performance of Cu and Fe zeolite in different gas condition for diesel NH <sub>3</sub> - SCR
14	14:15-14:30	Kenichiro Teshima	N06	Experimental study for condensation heat transfer of R1234ZE(z) on a horizontal tube
15	14:30-14:45	BAE Byeong Geon	N11	Development of droplet entrainment and deposition model in a horizontal annular flow

**Dec 5<sup>th</sup>, 2016. 15:00-17:00 Poster Session. Chen Ruiqiu Building.**

<b>Index</b>	<b>Author</b>	<b>Title</b>
P001	Yuta Sato	Relationships between plasma parameters and EUV emission profiles of laser produced Sn plasmas
P002	Ryota Kawase	Plasma flow field structure generated in an inhomogeneous magnetic field
P003	JUNKI SUWA	Cross section measurement for nuclide production in proton-induced reactions on <sup>91</sup> y
P004	MASAKI KAMIDA	Production of medical isotope <sup>92</sup> y using the C(D,N) accelerator-based neutron source
P005	HIKARU SATO	Investigation of lower-energy distribution of environmental cosmicray muon for soft error estimation
P006	Ikumi Fukuda	Axial structure of turbulence in PANTA
P007	Hao Long	Quantitative analysis of hydrogen outgassing from the vessel wall after long duration discharge in QUEST
P008	Shinichiro Kojima	Soft X-ray measurement of 28GHz RF plasma on ouest
P009	Hiroto Taguma	Effects of Neutral Particles on Plasma Turbulence in PANTA
P010	Ryosuke Minato	Observation of Spatiotemporal Structure of Plasma Flow with a Microwave Frequency Comb Doppler Reflectometer in PANTA
P011	Satoshi Abe	Numerical simulation on turbulent structural formation considering the neutral particle density profile in cylindrical plasmas
P012	Hideaki Kozai	Development of hard X-ray measurement for investigation of energetic electron in microwave-generated plasma on QUEST
P013	Tomohiro Ichimaru	Optimization of the voltage waveform applied to a hall thruster



P014	YU Jae-Hyun	Comparison of mechanical properties of casting part repaired by welding and additive metal –layer deposition
P015	JO Yeong-Kwan	Functional Gradient Layered Cladding Process for Enhancement of Wear and Impact Resistance Characteristics
P016	JIN Shun	Observation of adhesion energy of liquid droplets on flat solid surface
P017	HAM Seong-Kwan	Performance evaluation of offset strip fin heat exchanger according to variation of parameters
P018	KO Jaedeok	Thermodynamic non-equilibrium state of isobutane at the subcooled temperature condition in a vapor compression refrigeration system
P019	SEO Yong-Jin	Influence of oil and inner grooved tube on heat transfer performance in fin-and-tube evaporator of domestic refrigerator
P020	LEE Gaeun	Measurement of refrigerant characteristic in the non-equilibrium state
P021	LEE Wonjong	An evaluation of correlations for predicting refrigerant characteristics in adiabatic coil capillary tubes
P022	KIM Jeonggeon	Effect of aggregation on heat conduction performance in particulate composites
P023	CHUN Ju-hong	Production and Characterization of Ash-free coal from various types of biomass by solvent extraction
P024	JEONG Dong kyo	Microstructure control of bi-component catalysts using magnified corona discharging : Effects of charging states in terms of polarity and charge number
P025	SHIN MyoeongSu	Experimental study of the performance characteristics of a refrigerator with a linear compressor
P026	JI HanGyeol	A study of friction coefficient for a rolling piston rotary compressor
P027	JU Hong Su	Electrochemical conversion of carbon dioxide to solid carbon using molten carbonate electrolyte
P028	NA SangKyung	Performance analysis of the rotary compressor considering vane friction and discharge valve system
P029	LI Xinzhuo	Coal and PKS co-firing impacts on flame structure and combustion characteristics in a pulverized coal swirl burner

P030	OH Chaeho	Coal and PKS co-firing impacts on flame structure and combustion characteristics in a pulverized coal swirl burner
P031	OMID Nematollahi	A Feasibility Study of Solar Energy in South Korea
P032	KIM SooYeong	Measurements of Viscosity for Blood and Hemolysis Samples Using Microchannel
P033	MOON Chanhee	Heat transfer characteristics of open-cell metal foam: effect of ligament hollowness
P034	KIM Young- woo	Flow analysis of a dual-blade fan using particle image velocimetry
P035	KIM Dong	Effect of frost on phosphorescence for thermographic phosphor thermometry
P036	KIM Mirae	Flow Characteristics of Impinging Jet onto a Cylinder
P037	MATSUO Daichi	LIF measurement for neutral particles in inhomogeneous magnetic field
P038	KIM Changyeon	Effect of temperature on spray characteristics of liquid carbon dioxide
P039	LEE Siyeol	Effect of roughness alignment and scaling mass flow on the generation of turbulent boundary layer
P040	FENG Zhe	Lattice Boltzmann method simulation of lid-driven flow in semi-elliptical cavity
P041	MIAO Fuqing	Optimization of electroslog remelting process by using modified PSO algorithm
P042	LEE Damin	Use of successive ionic layer adsorption and reaction (SILAR) method for nano-porous nickel and cobalt hydroxide electrode composites for pseudocapacitor
P043	KIM Hokon	Effect of Calcium Hydroxide on the Electrochemical Reversibility of Zinc-Air Secondary Battery
P044	RYU Jae ho	Optimum Design of Rotor Shaft considering Mechanical Stress of Rotor Component in Flywheel Energy Storage
P045	SHIN Byung- Hyun	Effect of cooling rate on morphology of Austenite in Super Duplex Stainless Steel UNS S 32750

P046	SHIN Byung-Hyun	Effect of cooling rate and annealing temperature on grain growth in Super Duplex Stainless Steel UNS S 32750
P047	Zhenwei CAI	R5 procedure based damage estimation in a steam turbine valve under in-service conditions
P048	Peng LIU	Combustion Temperature, Equivalence Ratio and CO <sub>2</sub> Addition Effects on the Formation of PAHs in Premixed Ethylene Flames
P049	Liuxuan LUO	Pt Monolayer Shells on Pd <sub>0.54</sub> Ni <sub>0.46</sub> Nanospheres as a High-Performance Oxygen Reduction Reaction Electrocatalyst
P050	Zhen QIN	Construction of Z-scheme Photocatalysis Systems for Water Splitting under Visible Light by using zinc-doped g-C <sub>3</sub> N <sub>4</sub> /BiVO <sub>4</sub>
P051	Hongchao WANG	Synthesis of hierarchically porous MnO <sub>2</sub> /carbon hybrids for controlling formaldehyde emission
P052	Aiming WU	3D porous CNTs nanosheet material as the cathode of Lithium-O <sub>2</sub> batteries and its electrochemical performance
P053	Nailong ZHAO	Numerical Investigation on the Creep-fatigue Behavior in a Ultra-supercritical Steam Turbine Rotor
P054	Mohammad Tawheed Kibria	Effect of binders onto adsorption characterization of activated carbon based composites
P055	Ryo Matsuzawa	Sanction with jealousy makes cooperation grow
P056	LEE Donghyun	Effects of recycling harvested medium for microalgal cultivation in open raceway pond
P057	KIM Yura	Medium recycling for cultivation of various microalgal species
P058	KIM Seol Hee	Highly active metal organic framework umcm-15 for the room temperature cycloaddition of CO <sub>2</sub> and epoxides
P059	KIM Kon Won	Development of extraction method for the analysis of polychlorinated naphthalenes (PCNS) in sedimnet, fish (muscles and eggs)

P060	LEE Heon Jun	Analysis of Emerging Contaminants in Ground Water
P061	WANG Wenting	Hexabromocyclododecane (HBCD) distribution and evaluation of bioaccumulation in fish from major rivers, Korea
P062	Yajie LI	An advanced anaerobic biofilter with effluent recirculation for phenol removal and methane production in treatment of coal gasification wastewater
P063	Hui WANG	Effect on the bubble size of ozonation for the degradation of refractory substances in nanofiltration concentrated leachate
P064	Yihan CHEN	The analysis of water pollution and microbial ecology over multiple environmental gradients in the source area of the Dongjiang River
P065	Li ZHANG	Intracellular Uptake and Toxicity of Silver Nanoparticles by <i>Scenedesmus obliquus</i>
P066	Wenchao JI	A theoretical study of elemental mercury adsorption on $\text{Co}_3\text{O}_4$ (1 1 0) surface
P067	Azizah Intan Pangesty	Layered Construct of MSC sheet and PLCL Sheet For Patch Tissue Engineering
P068	CHAO WANG	Experiment study on the joint of CFRP and metal
P069	Tatsuya Takaki	Basic property of carbon fiber composite materials by VaRTM
P070	Keisuke Yamashita	Fabrication and Tensile Property Evaluation of Hybrid FRP
P071	Shohei Kamada	Nonlinear tensile deformation mechanism of balloon catheter
P072	Yuki Koya	Finite element analysis of osteoporotic spine with compression fracture
P073	Yoshitsugu Endo	Development of biodegradable fibrous scaffolds for tissue engineering application

P074	Takuya Kagawa	Synthesis and thermoelectric properties of layered oxyselenides and oxyphosphides
P075	Ryota Yamada	Improving the quality and reliability of CFRP by VaRTM process
P076	Sho Nakandakari	Graphene-Based Flexible Strain Sensors
P077	John Duckworth	Biomechanical finite element analysis of BKP implant materials on secondary fractures of spinal vertebrae
P078	Takuya Tsuru	Irradiation embrittlement of RPV steel model alloys with different Cu,Ni levels
P079	CHOI Junho	Numerical Simulations of Multi-stage Atomization of Liquid Metal Droplets
P080	PARK Jaephil	Effects of Cracking Test Conditions on Estimation Uncertainty of Weibull Parameters Considering Time-Dependent Censoring Interval
P081	PARK Wondong	A Parametric Study on Welding Process Simulation for Multi-Pass Welds
P082	KIM Sungue	Effects of Zinc Injection and Dissolved Hydrogen Concentration on ZIRLO™ Oxidation
P083	YUN Seong Tae	EXPERIMENTAL STUDY OF NONLINEAR LAMB WAVE BY DISTANCE
P084	PARK Ji Won	A study of quantitative analysis of wave scattering by inclined defect in a plate using the finite element analysis
P085	JE Gyeongju	A study on hydro microforming using multiple shock waves induced of pulsed laser
P086	YUN Dan Hee	Thermal Analysis of Via-Microgrooving of a Single Layer Using 355nm UV Pulsed Laser
P087	KIM Jong-Gu	Thermal properties of double-layered metals for heat sink application
P088	JU Jae-Hoon	Effect of oxy-nitriding process on the mechanical properties of steel
P089	MUTHUPA NDI Gokul	Structural characterization of AlCoCrFeNi high entropy alloy

P090	KIM Seo-Han	Characterization of CdTe thick films for direct conversion X-ray detectors
P091	KIM Shin	Characteristics of BDD electrodes deposited on Ti substrate with TiN interlayer
P092	PARK Yujin	Joint Property of Pb Solder and Pb-free Solders at High Temperature
P093	KIM Suyeon	Synthesis and electrochemical stability of $\text{La}_{0.8}\text{Sr}_{0.2}\text{MnO}_3$ and $\text{La}_{0.8}\text{Sr}_{0.2}\text{Co}_{0.8}\text{Fe}_{0.2}\text{O}_3$ cathodes for solid oxide fuel cells
P094	KIM Soonok	Synthesis and structural analysis of W doped $\text{CeO}_2/\text{TiO}_2$ for low temperature $\text{NH}_3$ -SCR
P095	PARK Kun Tae	Structural and Optical Properties of ITZO Deposited by RF Magnetron Sputtering
P096	KIM DoHyung	Adhesive Strength in Plastic-Epoxy Bonding
P097	PARK Jung Hyun	Effect of $\gamma'$ phase and $\text{M}_{23}\text{C}_6$ carbide formation on corrosion resistance on Ni-based superalloys
P098	JO Yeonal	Optoelectronic properties of cationic iridium complexes with pyrazole based ancillary ligands
P099	PARK Jung Hyun	Effect of microstructure on the potentio-dynamic properties with heat treatment of Udimet 520
P100	LEE Seon Wook	A study of vibration characteristics of chromium thin film material using micro cantilever
P101	MIN Jun Ki	Nonlinear Ultrasonic Guided Wave Behaviors in Wires for Material and Defect Characterization

## Keynote Speakers

### Professor Choi, Gyung-Min

Email: choigm@pusan.ac.kr

Tel: +82-51-510-2476, +82-10-4596-5585



### Schools Attended

Feb. 1992, B.S Degree in Mechanical Engineering, Pusan National University

Feb. 1994, M.S Degree in Mechanical Engineering, Pusan National University

Feb. 1997, Ph.D. in Mechanical Engineering, Pusan National University

Jan. 2002, Dr. Eng. Degree in Mechanical Engineering, Osaka University

### Research Interests

Clean Coal Technologies – Low NO<sub>x</sub> Combustion, Direct Carbon Fuel Cell, Reduction of Particulate Matter

Thermal Process Simulation

Refrigeration system, Air Conditional System Simulation, Compressor Simulation

Power Generation Engine -Engine Simulator, Ignition Analysis of Blending fuels

### Lecture Title

Correlation between the Electrochemical Reaction and Fuel Characteristic in Direct Carbon Fuel Cell System

### Abstract

Effects of fuel characteristics on electrochemical reactions in direct carbon fuel cell (DCFC) were investigated. The physical characteristics of fuel have an influence on cell performance because solid carbon was used as fuel. The thermal reaction, surface area, pore structure, and surface oxygen groups of carbonaceous fuels were analyzed by thermogravimetric analysis, BET, and XPS. The solid carbon which had volatile matter released gases under inert-gas atmosphere due to operating temperature (700°C). CO, H<sub>2</sub> and CO<sub>2</sub> released by thermal decomposition were used as sub-fuel. In addition, to investigate the correlation between electrochemical parameters and fuel surface properties, the bituminous coal was treated by HCl and HNO<sub>3</sub>. Through the correlation between electrochemical reaction and surface properties of solid fuels, ash contents on fuel surface increase the electrolyte resistance by removing carbonate ions. The negative correlation between oxygen groups and the charge transfer resistance at anode.

## Professor Seigi Mizuno

Prof. Seigi Mizuno is a vice dean of Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Japan. His major research interest is structure determination of solid surfaces. His research and publication lists are available from here.  
[http://www.mm.kyushu-u.ac.jp/lab\\_01/surface/mizuno/mizunoE.html](http://www.mm.kyushu-u.ac.jp/lab_01/surface/mizuno/mizunoE.html)



### Title:

Growth of  $\text{Si}_4\text{O}_5\text{N}_3$  Single Layer on  $\text{SiC}(0001)$  in Ultra-High Vacuum and Structure Determination Using Low-Energy Electron Diffraction

### Abstract

The epitaxial single  $\text{Si}_4\text{O}_5\text{N}_3$  layer has been formed on  $\text{SiC}(0001)$  surface using step by step growth in ultra-high vacuum condition. First,  $\text{SiC}(0001)$  surface with silicon adatoms was prepared. Second, the  $\text{Si}_2\text{ON}_3$  layer was formed by exposure of NO gas at  $950^\circ\text{C}$ . Third, the silicon was deposited on the surface and annealed to adjust the amount of oxidized at  $800^\circ\text{C}$ . The formation of  $\text{Si}_4\text{O}_5\text{N}_3$  layer was confirmed by low-energy electron diffraction analysis, Auger electron spectroscopy and scanning tunneling microscopy.



## **Professor Xinde Cao**

Shanghai Jiao Tong University, China

Prof. Xinde Cao is Vice Dean of School of Environmental Science and Engineering, Shanghai Jiao Tong University, China. He currently also serves as the Associate Editor of *Chemosphere* and sits on the Editorial Board of *Environmental Science and Pollution Research*. Prof. Cao got Ph.D degree of Analytical Chemistry from University of Science and Technology of China in 1998. He has over twenty years' experience working in environmental soil Chemistry and



remediation of contaminated soil and groundwater. He has been in charge of more than 20 state- or federal-funded projects. Prof. Cao has developed remediation technologies of in situ heavy metal mineralization immobilization, physical separation of heavy metal contaminated soils, simultaneous ecological restoration of contaminated soil and groundwater, etc which have been successfully applied in remediation of typical contaminated sites, such as abandoned e-waste recycling site, shooting range site, chemical factory site, and electroplating site in USA and China. He has published over 110 SCI research papers in peer-reviewed journals including *Environmental Science and Technology*, *Water Research*, etc. The total SCI citation was more than 5100 with overall evaluation h-index of 32.

### **Title:**

The current situation and challenge of the brownfield remediation in China

### **Abstract:**

In last two decades, the rapid development of urbanization in China left many abandoned industrial sites with contaminated soil which we call as brownfield. Soil at abandoned electroplating sites is contaminated with Zn and Cr. High concentrations of Pb along with Cu and Zn are often found in soil at battery recycling sites. In addition, elevated persistent organic contaminants (POPs) and emerging contaminants such as pharmaceuticals and personal care products (PPCPs) also accumulated in some brownfield sites. These sites are confronted with the high environmental risk when they are redevelopment. Therefore, it is imperative to remediate these brownfields before they can be used for living or commercial lands. This course focuses on the introduction of current situation, management regulations, remediation technology and challenge of brownfields in China. Since 1990's, Chinese government has adjusted urban land use structure by reducing enterprise land use and increasing service land use. Enterprise transformation and adjustment left a lot of brownfield sites which has potential health risk to environment and residents. Main sources of industrial site contamination include release of waste gas, waste water, and waste residue from the planting and factory. Automobile exhaust emissions is also a contributor to the brownfield site in these years. Typical industrial brownfield sites: steel, smelting, chemical factory, disposal of solid waste, landfill, incineration, fine chemicals, electroplating, e-waste recycling, and wood preservation treatment. "Bulletin of The National Survey of Soil Pollution" issued in April 17, 2014 shows that about one-third of the construction typical site and surrounding area is contaminated with heavy metals or/and organic contaminants. Specifically, there are 21.3% solid waste disposal, 23.6% of oil field, 29.4%

of industrial park, 33.4% mining area, and 33.9% of abandoned site, and 36.3% of pollution factory exceeding standard rates.

At the beginning of 21th century, China government started to pay much attention to the soil pollution control and remediation by issuing a series of the documents and regulations. China Ministry of Environmental Protection issued “Strengthening of soil pollution prevention and control work” in 2008, “Interim Measures on soil environmental management of contaminated sites” in 2010, and “Strengthening environmental management for enterprise closed down, relocation, and site redevelopment and utilization in 2014. Most importantly, China government implement the “Plan of action for prevention and control of soil pollution” starting from June, 2016. Finance support for brownfield remediation increases greatly from about 1 billion RMB in 2005 to about 100 billion RMB in 2015

Site remediation process generally can be divided into three phases: Phase I, site survey, contamination analysis, and risk assessment; Phase II: soil remediation technology design; and Phase III, soil remediation implementation, effectiveness evaluation, and maintenance. A lot of remediation technologies have been developed including ex situ thermal desorption, ex situ vapor extraction, ex situ temperature thermal desorption, ex situ/in situ chemical oxidation, ex situ/in situ solidification/stabilization, cement kiln co-processing, etc. Among them, solidification/stabilization, cement kiln co-processing, and chemical oxidation, which occupies 73% of all methods.

Currently, China faces several challenges: (1) verification of three dimension edges of site remediation; (2) domestication of risk evaluation parameters; (3) formulation of risk evaluation criteria; (4) establishment of assessment and remediation standard; (5) screening of technology optimization; and (6) development of financial system for the site remediation

## **Professor Peng Zhang**

Affiliation: School of Mechanical Engineering,  
Shanghai Jiao Tong University, China

E-mail: zhangp@sjtu.edu.cn

Tel: +82-21-3420-5505



### **Schools Attended**

July 1995, B.S Degree in Power Engineering, Shanghai Jiao Tong University

Mar. 1999, Ph.D. in Power Engineering, Shanghai Jiao Tong University

2002-2004, JSPS Post Doc., University of Tsukuba

### **Research Interests**

Flow and heat transfer, from 2 K~

Thermal energy storage

Refrigeration and Air Conditioning Engineering

CO<sub>2</sub> absorption by clathrate hydrate

### **Title**

Investigation of clathrate hydrate for cold energy storage

### **Abstract**

Cold energy storage in refrigeration and air-conditioning is very necessary to improve the energy efficiency, to reduce peak-valley electricity load difference and to maintain safe operation of the electric grid. But there are drawbacks of the traditional cold energy storage by water or ice, and new technology for cold energy storage is very urgent. Tetra-n-butyl Ammonium Bromide (TBAB) clathrate hydrate slurry (CHS) is one of the promising two-phase phase change material slurries, which can be employed as both the cold energy storage and transport media simultaneously in refrigeration and air-conditioning systems. In the present study, we report the fundamental flow and heat transfer characteristics of TBAB CHS, which are important for its further investigation and applications.

## **Contacts:**

### **Lingti Kong (MR.)**

Director of International Affairs Office,  
Graduate School of SJTU  
Telephone: +86 21 34207040  
Mobile: +86 170-9191-9732  
Email: [konglt@sjtu.edu.cn](mailto:konglt@sjtu.edu.cn)

### **Dawei Yang (MR.)**

International Affairs Office  
Graduate School, Shanghai Jiao Tong University  
Telephone: +86 21 34207040  
Mobile: +86 152-1671-2507  
Email: [dwyang@sjtu.edu.cn](mailto:dwyang@sjtu.edu.cn)

### **Eric Wu (MR.)**

Coordinator, School of Mechanical Engineering  
Telephone: +86 21 34205875  
Mobile: +86 152-2107-8436  
Email: [ericwu@sjtu.edu.cn](mailto:ericwu@sjtu.edu.cn)