



# The 8<sup>th</sup> International Conference on Materials Science and Technology



In Parallel with

## The 8<sup>th</sup> Thailand Metallurgy Conference

December 15-16, 2014 Swissotel Le Concorde, Bangkok, Thailand

### Jointly Organizers



### Supporters & Sponsors



The 8<sup>th</sup> International Conference on Materials Science and Technology (MSAT-8) organized by National Metal and Materials Technology Center or MTEC, the bi-annual event has been held since 2000.

For the first time, MSAT-8 was held in parallel with the 8<sup>th</sup> Thailand Metallurgy Conference (TMETC-8) and 2 special sessions titled “Thailand-Japan Polymer Initiative” and “Tribology Technical Session”, as well as the annual meetings of the Thai Tribology Association (TTA) and Thai Corrosion of Metal and Materials Association (TCMA). The series of events were served as catalysts for the advances in the study of materials science and its application by connecting scientists and professionals within and across disciplines at sessions and exhibitions held at the venue.



**660 Participants from**



### 18 Countries

Arab Emirates, Australia, China P.Rep, Czech Republic, Germany, India, Indonesia, Iran, Japan, Malaysia, Pakistan, Philippines, Singapore, South Korea, Taiwan, Thailand, UK, USA

<b>MSAT-8</b>	<b>521</b>
<b>TMETC-8</b>	<b>104</b>
<b>Special Sessions</b>	<b>35</b>



### 331 Presentations from

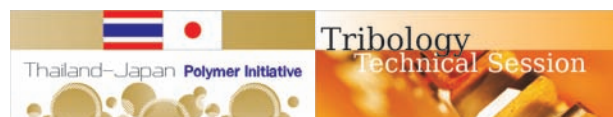
<b>MSAT-8</b>	<b>271</b>	<b>(Oral 139, Poster 132)</b>
<b>TMETC-8</b>	<b>60</b>	<b>(Oral 47, Poster 13)</b>

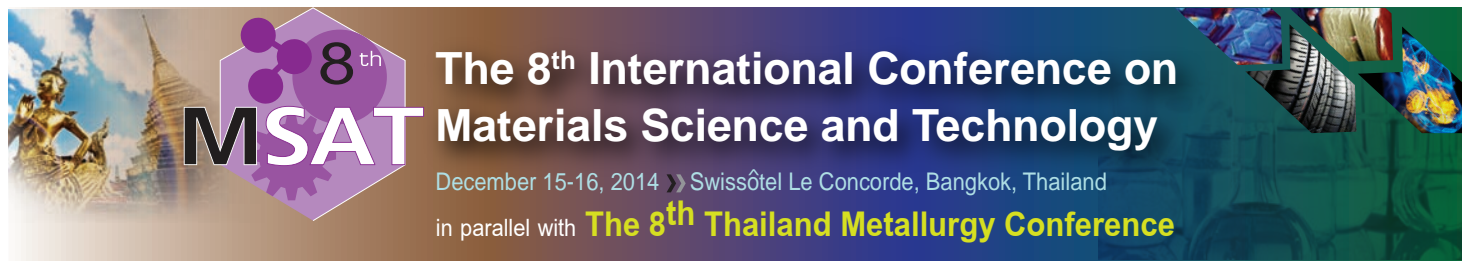


**3 Plenary,  
5 Keynote and  
40 Invited Talks**

### 2 Special Sessions

Thailand-Japan Polymer Initiative  
Tribology Technical Session





## Best Poster Award

### ■ Biomedical Materials and Devices Session

“Osteoblast Responses on Graphene Oxide Electrodeposited on Anodized Titanium for Orthopedic Implants”

**Pacharaporn Tanurat**

Biological Engineering Program, Faculty of Engineering, King Mongkut's University of Technology Thonburi, Thailand

### ■ Ceramic-based Materials Session

“Fabrication of Porous Hollow Cylinder Activated Carbon-Zeolite Substrate”

**Nithiwach Nawaukkaratharnant**

Department of Materials Science, Chulalongkorn University, Thailand

“Effect of Firing Temperature and Mo Doping on Properties of Solar-Reflective  $\text{Sm}_2\text{Ce}_2\text{O}_7$  Yellow Pigment”

**Mantana Suwan**

National Metal and Materials Technology Center, Thailand

### ■ Materials for Energy Session

“Removal of Hydrogen Sulfide from Gas Streams in a Single Packed Column System”

**Kiatkong Suwannakij**

National Metal and Materials Technology Center, Thailand

### ■ Materials Technology for Environment Session

“Adsorptive Removal of Methylene Blue from Aqueous Solution by Bamboo and Macadamia Nut Shells Charcoals Activated with Different Chemicals”

**Chabaiporn Jun-in**

National Metal and Materials Technology Center, Thailand

### ■ Material Reliability Session

“Effect of Soil Properties on Corrosion of Hot Dip Galvanized Steel for Underground Application”

**Namurata Sathirachinda Palsson**

National Metal and Materials Technology Center, Thailand

### ■ Metals, Alloys and Intermetallic Compounds Session

“Corrosion Inhibition Efficiency of Pineapple Leaves for Mild Steel in Natural Water”

**Kunapat Pitpanyachut**

Department of Chemistry, Faculty of Science, Mahidol University, Thailand

### ■ Polymer-based Materials Session

“Effect of Components on the Electrical Property of Stretchable Carbon Black Electrode”

**Tae-Won Lee**

Department of Materials Science and Engineering, Yonsei University, South Korea

“Influence of Proteins on Thermal-Oxidative Degradation of Peroxide Cross-Linked Natural Rubber as Revealed by  $^1\text{H}$  Double-Quantum NMR”

**Adun Nimpaiboon**

Department of Chemistry and Center of Excellence for Innovation in Chemistry, Faculty of Science, Mahidol University, Thailand

### ■ Simulation, Design and Manufacturing Session

“Application of Numerical Method and Statistical Analysis in the Integrated Intensity Calculation of the Peaks from the X-Ray Diffraction (XRD) Pattern of  $\alpha$ -Iron”

**Parinya Chakartnarodom**

Department of Materials Engineering, Faculty of Engineering, Kasetsart University, Thailand

### ■ Surface Engineering and Heat Treatment Session

“Comparative Study of Non-Annealing and Annealing on the Properties of ITO Deposited by RF Magnetron Sputtering”

**S.Tipawan Khlayboonme**

Department of Physics, Faculty of Science, King Mongkut's Institute of Technology Ladkrabang, Thailand



## Best Oral Presentation Award

### ■ Thai Parkerizing Best Professional Paper Award (20,000 THB)

“Investigation and Characterization of Crystalline ZrN Thin Films Deposited by DC Reactive Magnetron Sputtering on Unheated Substrate for Decorative-Coating Applications”

**Arunee Lakkham**

National Metal and Materials Technology Center, Thailand

### ■ Thai Parkerizing Best Professional Paper Award (20,000 THB)

“Residual Stresses and Fatigue Performance of Modified Mechanical Surface Treated Martensitic Stainless Steel AISI 420”

**Patiphan Juijerm**

Department of Materials Engineering – Metals Research Group, Faculty of Engineering, Kasetsart University, Thailand

### ■ Thai Parkerizing Best Student Paper Award (20,000 THB)

“The Effects of  $O_2:N_2$  Gas Ratios on Structural, Optical, Electrical Properties of  $TiO_xN_y$  Thin Film deposited by Reactive DC Magnetron Sputtering”

**Tanakorn Khumtong**

College of Data Storage Innovation, King Mongkut's Institute of Technology Ladkrabang, Thailand.

### ■ Thai Corrosion of Metals and Materials Association Best Paper Award (10,000 THB / award)

“Sulfide Stress Cracking of Welded High Carbon Low Alloy Steel”

**Namurata Palsson**

National Metal and Materials Technology Center, Thailand

“Evaluation of Stress Corrosion Cracking Resistance of Welded Stainless Steels by Accelerated Immersion Tests”

**Amnuaysak Chianpairot**

National Metal and Materials Technology Center, Thailand



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## Best Oral Presentation Award

### Structures Session (10,000 THB / award)

“Electron Microscopy and Erosion-Corrosion Properties of High Chromium Cast Irons with Mo or W Addition”

**Torranin Chairuangstri**

Chiang Mai University, Thailand

“Deformation Behaviour of Medium Carbon Steel Processed by ECAP”

**Jozef Zrník**

COMTES FHT. Inc., Czech Republic

### Processing Session (endorsed by POSCO-Thainox Public Company Limited)

#### Researcher and Post Graduate Level (25,000 THB)

“Effect of Cooling Rate after Solution Treatment on Precipitates in Extruded ZK60 Alloy”

**Chuleeporn Paa-Rai**

University of Manchester, United Kingdom

#### Graduate and Under-graduate Level

“The Influence of Black Trivalent Chromate Conversion Coating's Parameter on The Color Appearance of Electroplated Zinc Coatings”

Student (20,000 THB): **Nirada Pintuperakovit**

Supervisor (10,000 THB): **Yuttanant Boonyongmaneerat**

Department (35,000 THB): Metallurgical Engineering, Faculty of Engineering, Chulalongkorn University, Thailand

### Properties Session (10,000 THB / award)

“Flow Curves Prediction of Heat Treated Boron Alloy Steels for Hot Stamping Process”

**Prapatsorn Srithananan**

King Mongkut's University of Technology Thonburi, Thailand

“Drilled Hole Technique for Created Single Point Incremental Forming Limited Diagram”

**Kittiphath Rattanachan**

King Mongkut's University of Technology North Bangkok, Thailand

### Applications Session (10,000 THB / award)

“Stress Corrosion Cracking at Benfield Regeneration Column”

**Suphit Thienmethawut**

PTT Public Company Limited, Thailand

“Direct Observation of Liquation in Ni-base Superalloy by using Confocal Laser Scanning Microscopy”

**Noppakorn Phuraya**

King Mongkut's University of Technology Thonburi, Thailand

### Nano Materials & Technology (10,000 THB / award)

“XAS Technique for Advanced Chemical and Structural Analyses of Metal Alloys and Metal Composites”

**Nirawat Thammajak**

Synchrotron Light Research Institute, Thailand

“The Role of Fluorosurfactant on Cu-Sn Electrodeposition from Methanesulfonic Acid”

**Naray Pewnim**

Maejo University, Thailand

## Best Poster Award (10,000 THB / award)

“Determination of Mechanical Adhesion Energy of Thermal Oxide Scales on Medium and Thin Slabs using Tensile Test”

**Thanasak Nilsonthi**

King Mongkut's University of Technology North Bangkok, Thailand



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## Thailand Metallurgist Award 2014



It has been widely accepted that “metal” is one of the irreplaceable key materials in some important national areas. Since it is an important material, a huge research effort has been devoted to the development of this metallic material for Thailand sustainable growth. To encourage those who greatly contributed their achievements to metallurgical field, the Thailand metallurgist award and the young metallurgist award were first established in 2007. At the time, the awards were presented to the winners at the first Thailand metallurgy conference.

The purpose of the Thailand metallurgist award and the young metallurgist award is to seek out persons who work in metallurgical field and have continuously presented outstanding achievements in metallurgical development. Those accomplishments are not only illustrating novel innovations but are also represented the significant benefitsto the organization or well recognised in the industrial applications.

The criteria for the awards are based on the record of outstanding performance focusing on both the quantity and the quality of the well-recognised work. The publication of the work in highly accepted journals and international citations of the work are considered. The judges are consisted of a panel of distinguished academics who have taken into consideration the contribution of each nominated candidate. The nominated candidates should also have personal dedication to metallurgical field, respectful behaviour, and are considered suitable to be esteemed as an excellent metallurgist.

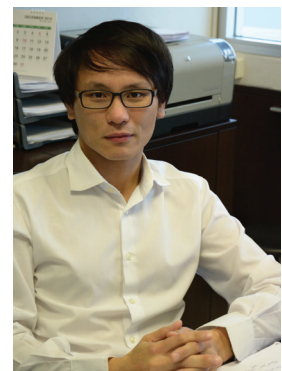
This year, the judging committees of the 8<sup>th</sup> Thailand metallurgy conference extremely grateful to honour Associate Professor Siriluck Nivitchanyong and Associate Professor Dr.Torranin Chairuangstri for the Thailand metallurgist award 2014 and to honour Assistant Professor Dr.Vitoon Uthaisangsuk for the young metallurgist award 2014.



**Associate Professor Siriluck Nivitchanyong**  
Deputy Executive Director  
National Metal and Materials Technology Center  
National Science and Technology Development Agency  
Ministry of Science and Technology



**Associate Professor Dr. Torranin Chairuangstri**  
Department of Industrial Chemistry  
Faculty of Science  
Chiang Mai University



**Assistant Professor Dr.-Ing. Vitoon Uthaisangsuk**  
Department of Mechanical Engineering  
Faculty of Engineering  
King Mongkut's University of Technology Thonburi

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## รางวัลนักโลหะวิทยาดีเด่น พ.ศ. ๒๕๕๗ Thailand Metallurgist Award 2014



รองศาสตราจารย์ ศิริลักษณ์ นิวิฐจรรยงค์  
Associate Professor Siriluck Nivitchanyong

ศูนย์เทคโนโลยีโลหะและวัสดุแห่งชาติ  
สำนักงานพัฒนาวิทยาศาสตร์และเทคโนโลยีแห่งชาติ  
กระทรวงวิทยาศาสตร์และเทคโนโลยี

National Metal and Materials Technology Center  
National Science and Technology Development Agency  
Ministry of Science and Technology

Siriluck Nivitchanyong is a Deputy Executive Director at National Metal and Materials Technology Center, National Science and Technology Development Agency. She was a senior expert on corrosion of engineering metals and alloys at Thai French Institute, King Mongkut's University of Technology North Bangkok. She graduated from Chulalongkorn University. Her Bachelor degree was in Chemistry and her Master degree was in Analytical Chemistry. She attended in many well-known Research Institutes, both in Europe and United State of America, as a guest researcher on metallic corrosion evaluation, monitoring, prevention and control. She is an author of a corrosion and materials selection textbook which is widely used for under graduate courses in Thailand. Moreover, she published several scientific articles concerning corrosion of engineering metals and alloys. Her main research interests are electrochemical techniques for corrosion evaluation, corrosion resistant alloys and corrosion prevention and control. She precipitated into various industrial projects from food can manufacturing to coating processing. She was also a founder of Thai Corrosion of Metal and Materials Association and a co-founder of Thai Tribology Association.

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## รางวัลนักโลหะวิทยาดีเด่น พ.ศ. ๒๕๕๗ Thailand Metallurgist Award 2014



รองศาสตราจารย์ ดร. ธรณินทร์ ไชยเรืองศรี  
Associate Professor Dr. Torranin Chairuangsi

ภาควิชาเคมีอุตสาหกรรม  
คณะวิทยาศาสตร์  
มหาวิทยาลัยเชียงใหม่

Department of Industrial Chemistry  
Faculty of Science  
Chiang Mai University

Torranin Chairuangsi is an associate professor in metallurgy at the Department of Industrial Chemistry, Faculty of Science, Chiang Mai University, where he was former Head of Department during 2006-2014 and took important part in establishing graduate programs. He graduated from Chiang Mai University, Thailand, with Bachelor of Science degree in industrial chemistry in 1993 and obtained Doctor of Philosophy degree in metallurgy from University of Leeds, UK, in 1998. His major scientific field of interest is electron microscopy of cast metals. He has published over 100 scientific articles in journals and proceedings. He is the author of a textbook "Basics of Transmission Electron Microscopy for Metallurgy and Materials Science" used for graduate courses in Thailand. He was awarded "Chang-Tong-Kum" Young Outstanding Researcher from Chiang Mai University in 2005 and Young Asian Electron Microscopist at the 65th Annual Meeting of the Japanese Society of Electron Microscopy, Sendai, Japan, in 2009. Also, he has collaborated with industries in development of high chromium cast irons, electrodes in zinc hydrometallurgical plant and silver alloys. He is now the President of the Microscopy Society of Thailand.

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## รางวัลนักโลหะวิทยารุ่นเยาว์ดีเด่น พ.ศ. ๒๕๕๗ Young Outstanding Metallurgist Award 2014



ผู้ช่วยศาสตราจารย์ ดร. วิทูร อุทัยแสงสุข  
Assistant Professor Dr.-Ing. Vitoon Uthaisangsuk

ภาควิชาวิศวกรรมเครื่องกล  
คณะวิศวกรรมศาสตร์  
มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี

Department of Mechanical Engineering  
Faculty of Engineering  
King Mongkut's University of Technology Thonburi

Vitoon Uthaisangsuk is an assistant professor and course director of postgraduate studies at the Department of Mechanical Engineering, King Mongkut's University of Technology Thonburi. He was a Thai government scholarship holder. He graduated from RWTH Aachen University, Germany with a diploma and PhD in Mechanical and Metallurgical Engineering. His main research interests are advanced high strength steels, mechanical metallurgy, fracture and damage mechanics as well as Finite Element analysis. His current research works include investigation of manufacturing, mechanical and forming behaviour of high strength steel sheets for automotive parts.