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\textsuperscript{1}Sunchon National University, Korea. \textsuperscript{2}Chonnam National University, Korea

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\textsuperscript{1}Gyeongsang National University, Korea, \textsuperscript{2}Chosun University, Korea

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Young-Chul Lee¹, Hyun Uk Lee², Minhyung Lee³, Janghwan Kim³, and Yun Suk Huh⁴

¹Gachon University, Korea, ²Korea Basic Science Institute, Korea, ³Korea Research Institute of Bioscience and Biotechnology, Korea, ⁴Inha University, Korea

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Cheol Hwan Kwak¹, Arun Kumar Rengaraj¹, Gibum Kim², and Yun Suk Huh¹

¹Inha University, Korea, ²Plexense, Korea

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Mokpo National University, Korea

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¹Korea Textile Development Institute, Korea, ²Kyungpook National University, Korea, ³Chonnam National University, Korea, ⁴Chungbuk National University, Korea

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Fei Zhao and Jongsung Kim

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Junho Won¹, Ok-Cheol Jeon², Youngro Byun², and Jin Woo Park¹

¹Mokpo National University, Korea, ²Seoul National University, Korea

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¹*National Chiao-Tung University, Taiwan, ²Chung Hua University, Taiwan, ³Mingdao High School, Taiwan*
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¹Mokpo National University, Korea. ²Jeju National University, Korea. ³University of California San Diego, USA
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Han-Cheol Choe¹ and Yong-Hoon Jeong²
¹Chosun University, Korea, ²The Ohio State University, USA

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T. D. Le¹, T. H Dung², K. D. Eom³, and H. Yoo³
¹Duy Tan University, Vietnam, ²Hue Medicine and Pharmacy University, Vietnam, ³Chosun University, Korea

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¹Youngsan University, Korea, ²Chosun University, Korea

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Baik-Dong Choi¹, Hye-Yon Lee¹, Soon-Jeong Jeong², Do-Seon Lim³, and Moon-Jin Jeong¹
¹Chosun University, Korea, ²Youngsan University, Korea, ³Eulji University, Korea

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¹Sungkyunkwan University, Korea, ²Hongik University, Korea
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¹Chonnam National University, Korea, ²Korea Institute of Science and Technology, Korea

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Gachon University, Korea

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Taegyu Kim¹ and Dae Hoon Lee²
¹Chosun University, Korea, ²Korea Institute of Machinery and Materials, Korea
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Yoo-jin Go¹, Gwang-sub Go¹, Nam-cook Park¹, Young-chul Kim¹, and Dong-Ju Moon²

¹Chonnam University, Korea, ²Korea Institute Science and Technology, Korea

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Ho-Geun Ahn¹, Hwan-Gyu Lee¹, Min-Chul Chung¹, Kwon-Pil Park¹, Ki-Joong Kim², Byeong-Mo Kang³, Woon-Jo Jeong³, Sang-Chul Jung¹, and Do-Jin Lee¹

¹Sunchon National University, Korea, ²Oregon State University, USA, ³OT&T, Inc., Korea

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Hwan-Gyu Lee¹, Young-Ho Lee¹, Hyeon-Jun Yun¹, Jang-Ho Jo¹, Seong-Kyung Kim¹, Hyeon-Jin Yu¹, Byeong-Mo Kang³, Woon-Jo Jeong³, Min-Chul Chung¹, Sang-Chul Jung¹, Do-Jin Lee¹, and Ho-Geun Ahn¹

¹Sunchon National University, Korea, ²OT&T, Inc., Korea

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Daeil Park and Taegyu Kim

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Hyeonhee Choi¹, Hyuna Kim¹, Young-Kwon Park², and Jong-Ki Jeon¹

¹Kongju National University, Korea, ²University of Seoul, Korea

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Jihye Park and Miewon Jung

Sungshin Women's University, Korea

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Young-Kwon Park¹, Hyung Won Lee¹, Chang Seok Jeong¹, Sung Hoon Park², Sang Chul Jung², Sang Chai Kim³, and Jong-Ki Jeon⁴

¹University of Seoul, Korea, ²Sunchon National University, Korea, ³Mokpo National University, Korea, ⁴Kongju National University, Korea

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Young-Kwon Park¹, Chang Seok Jeong¹, Sung Hoon Park², Sang Chul Jung², Sang Chai Kim³, and Jong-Ki Jeon⁴

¹University of Seoul, Korea, ²Sunchon National University, Korea, ³Mokpo National University, Korea, ⁴Kongju National University, Korea

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Young-Kwon Park¹, Woo Hyun Kwon¹, Jeong Huy Ko¹, Sung Hoon Park², Sang Chul Jung², Sang Chai Kim³, and Jong-Ki Jeon⁴

¹University of Seoul, Korea, ²Sunchon National University, Korea, ³Mokpo National University, Korea, ⁴Kongju National University, Korea
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Young-Kwon Park¹, Hannah Kim¹, Sung Hoon Park², Sang Chul Jung², Sang Chai Kim³, and Jong-Ki Jeon⁴

¹University of Seoul, Korea, ²Sunchon National University, Korea, ³Mokpo National University, Korea, ⁴Kongju National University, Korea

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¹Sungkyunkwan University, Korea, ²Hongik University, Korea

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Sang Chai Kim¹, Ho-Young Jung², Seung Won Nahm¹, and Young-Kwon Park²,³

¹Mokpo National University, Korea, ²Chonnam National University, Korea, ³University of Seoul, Korea

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Min Hui Heo¹, Ho-Young Jung², and Sang Chai Kim¹

¹Mokpo National University, Korea, ²Chonnam National University, Korea

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Young-Kwon Park¹, Jeong Huy Ko¹, Sung Ho Jin¹, Sung Hoon Park², Sang Chul Jung², Sang Chai Kim³, and Jong-Ki Jeon⁴

¹University of Seoul, Korea, ²Sunchon National University, Korea, ³Mokpo National University, Korea, ⁴Kongju National University, Korea
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Ki Min Nam, Kyung Hee Oh, and Mi Hwang

*Mokpo National University, Korea*

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*The Catholic University of Korea, Korea*

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Jiyeon Baek¹, Nayoon Kwon², Yeram Kim², Sunghee Kim², and Yul Roh¹

¹*Chonnam National University, Korea, ²Gwangju Science Academy for the Gifted, Korea*

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Ho-Jeong Chae¹, Min Kim¹, Ju-Wan Kim¹, Tae-Wan Kim¹, Won-Joo Lee¹, Chul-Ung Kim¹, Soon-Yong Jeong¹, and Kyoung-Su Ha²

¹*Korea Research Institute of Chemical Technology, Korea, ²Sogang University, Korea*

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Seon-Gyun Rho¹, Ung-II Kang¹, Sang Chai Kim², and Ho-Young Jung¹

¹*Chonnam National University, Korea, ²Mokpo National University, Korea*
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P2-81 The Development of Novel Pt/sulfonated Silica Electrocatalysts as a Bifunctional Oxygen Electrode for Unitized Regenerative Fuel Cell

Ung-Il Kang¹, Seon-Gyun Rho¹, Sang-Chai Kim², and Ho-Young Jung³  
¹Chonnam National University, Korea, ²Mopo National University, Korea

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Hyoung-Ju Yoon and Tae-Ho Yoon  
Gwangju Institute of Science and Technology, Korea

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Xiaochuan Li¹, Jingli Xu¹, Wenyan Xu¹, Yaya Zhang¹, and Young-A Son²  
¹Henan Normal University, China, ²Chungnam National University, Korea

P2-84 Investigation of Coumarin and Naphthalimide Based Energy Transfer Cassette with –NHCH₂CH₂NH- as the Bridging Unit

Xiaochuan Li¹, Yuhe Zhou¹, Yingchao Zhang¹, and Young-A Son²  
¹Henan Normal University, Korea, ²Chungnam National University, Korea

P2-85 Reduction of Frictional Resistance of Hard Metal Surface with Soft Metal Nano Particles

Won Jun Lee and Chong Soo Han  
Chonnam National University, Korea
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Ung-Il Kang and Jee-Won Yang

1Chonnam National University, Korea, 2Portsmouth Abbey School, USA

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Dae-Il Lee, Se-Ra Shin, and Dai-Soo Lee

Chonbuk National University, Korea

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Huijin Kim1,2, Daesup So3, Sungjin Park2, and Hoon Huh1

1Korea Institute of Industrial Technology, Korea, 2Inha University, Korea, 3Korea Institute of Science and Technology, Korea

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D. A. Hakeem, H. Kim, J. S. Cha, and K. Park

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Dong Shin Won1, In-Su Park2, Myounghoon Park1, Kang-Sup Chung2, Kee Suk Nahm1, and Pil Kim1

1Chonbuk National University, Korea, 2Korea Institute of Geoscience and Mineral Resources, Korea
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Yeonsun Sohn¹, Hyun Kang¹, Dongha Lim², Kee Suk Nahm¹, and Pil Kim¹
¹Chonbuk National University, Korea, ²Korea Institute of Industrial Technology, Korea

P2-92 Properties of Pd, Pt and Ru Based Catalysts in Catalytic Oxidation of Methanol
Seung Won Nahm¹, Young Kwon Park², Sang Chul Jung³, Seong Gyu Seo⁴, and Sang Chai Kim¹
¹Mokpo National University, Korea, ²University of Seoul, Korea, ³Sunchon National University, Korea, ⁴Chonnam National University, Korea

P2-93 A Fluorescence Turn-on Sensor for Explosives Based on Carbon Quantum Dots
Sung Gi Lee and Honglae Sohn
Chosun University, Korea

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Woo-Hyeon Cho, Chan Kim, Tae-Young Kim, Kyung-Hee Park, and Jae-Wook Lee
¹Chosun University, Korea, ²Amotech New Materials Research Center, Korea, ³Chonnam National University, Korea
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Seul Bee Lee\(^1\), Soo Na Park\(^1\), Chanwoo Kim\(^1\), Ho Won Lee\(^2\), Young Kwan Kim\(^2\), and Seung Soo Yoon\(^1\)

\(^1\)Sungkyunkwan University, Korea, \(^2\)Hongik University, Korea

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Pukyong National University, Korea

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Nguyen Duy Trinh and Seong-Soo Hong

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Nokyoung Park\(^1\), Il Tae Kim\(^2\), and Jaehyun Hur\(^2\)

\(^1\)Samsung Electronics, Korea, \(^2\)Gachon University, Korea
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Mohammad Shahid, Ibrahim El Saliby, Leonard D. Tijing, Andrew McDonagh, Jong Beom Kim, Jong-Ho Kim, and Ho Kyong Shon

1University of Technology Sydney, Australia 2Chonnam National University, Korea

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1Seoul National University, Korea, 2Inha University, Korea

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Mokpo National University, Korea

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Dong-gyun Kim, Jong Hak Kim, and Sang Woo Kim

1Korea Instute of Science and Technology, 2Yonsei University
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$^1$*Korea Institute of Industrial Technology, Korea, $^2$Chonnam National University, Korea*

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$^1$*Korea Institute of Industrial Technology, Korea, $^2$Chonnam National University, Korea*
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Jeongdong Choi¹, Youngho Ahn¹, Mohamed Gamal El-Din², and Eun-Sik Kim³
¹Yeungnam University, Korea, ²University of Alberta, Canada, ³Chonnam National University, Korea

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¹Chonnam National University, Korea, ²Yeungnam University, Korea

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¹National Taipei University of Technology, Taiwan, ²National Taiwan Normal University, Taiwan

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¹Korea Institute of Industrial Technology, Korea, ²Korea Institute of Ocean Science and Technology, Korea, ³Korea Institute of Geoscience and Mineral Resources, Korea, ⁴H&H Co. LTD., Korea, ⁵Hanyang University, Korea, ⁶PuKyong National University, Korea

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R. Rajesh1,2, M. Jeevan Kumar Reddy2, Kwong Ho Won2, Sung Hun Ryu2, Y. Dominic Ravichandran1, and A. M. Shanmugharaj2

1VIT University, India, 2Kyung Hee University, Korea

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Tae Hoon Kim1, Kwang Won Park2, and Jong Su Kim2

1Lumimicro Co., Ltd., Korea, 2Pukyong National University, Korea

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Kwang Won Park1, Tae Hoon Kim2, Ji Hoon Kim2, and Jong Su Kim1

1Pukyong National University, Korea, 2Lumimicro Co., Ltd., Korea

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Silla University, Korea
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Kwangwon Park, Seokkyu Lim, Taehoon Kim, and Jongsu Kim
1Pukyong National University, Korea, 2Lumimicro Co., Ltd., Korea

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Chunyuan Liu, Yu Bian, Younghwan Kwon, and Jin Seuk Kim
1Daegu University, Korea, 2Agency for Defense Development, Korea
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Zhongyou Han, Younghwan Kwon, and Chang Kee Kim
1Daegu University, Korea, 2Agency for Defense Development, Korea

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Xuan Thang Cao, Ali Md. Showkat, Inpil Kang, and Kwon Taek Lim
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Shinho Cho
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Moonhwan Kim and Shinho Cho
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Je-Hyeok Ryu$^1$, Phimmavong Kongsy$^1$, Jeong-Hwan Song$^1$, Dae-Young Lim$^1$, and Seung-Beom Cho$^2$
1PaiChai University, Korea, 2LG Chem. Ltd, Korea
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Min-Ji Kim¹, Tae-Wan Kim¹, Ho-Jeong Chae³, Chul-Ung Kim¹, Soon-Yong Jeong³, Jeong-Rang Kim¹, and Kyoung-Su Ha²

¹Korea Research Institute of Chemical Technology, Korea, ²Sogang University, Korea

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Na-Yeon Kwon¹, Young Do Kim³, Myung-Jin Suk³, Seong Lee⁴, and Sung-Tag Oh¹

¹Seoul National University of Science and Technology, Korea, ²Hanyang University, Korea, ³Kangwon National University, Korea, ⁴Agency for Defense Development, Korea

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Tae-Hyun Lim and Hyuk-Ryeol Park

Mokpo National University, Korea

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Narae Shin¹, Taekyeong Kim¹, Jaesung Park², Hye Jun Jin¹, Hyungwoo Lee¹, Kyung-Eun Byun¹, Chang-Seuk Lee³, Kwang S Kim², Byung Hee Hong¹, Tae Hyun Kim³, and Seunghun Hong¹

¹Seoul National University, Korea, ²Pohang University of Science and Technology, Korea, ³Soonchunhyang University, Korea
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**Electrical Bistabilities and Conduction Mechanisms of Nonvolatile Memories Based on a Polymethylsilsesquioxane Insulating Layer Containing CdSe/ZnS Quantum Dots**

Zehao Ma¹, Poh Choon Ooi², Fushan Li², Dong Yeol Yun¹, and Tae Whan Kim¹  
¹Hanyang University, Korea, ²Fuzhou University, China

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Kyungho Kang and Kwangmin Lee  
Chonnam National University, Korea

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Korea Research Institute of Chemical Technology, Korea

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Eun-Byul Ko, HyungSung Jung, and Chang-Yeoul Kim
Korea Institute of Ceramic Engineering and Technology, Korea

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Woong-Ki Hong¹, Byoung-Guk Park², SeungNam Cha³, and Jung Inn Sohn³
¹Korea Basic Science Institute, Korea, ²Korea Advanced Institute of Science and Technology, Korea, ³University of Oxford, UK

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Qi Dong¹, Chunyuan Lu¹, Tulugan Kelimu², Jeong Wan Kim¹, and Tae Gyu Kim¹
¹Pusan National University, Korea, ²Gyeongsang National University, Korea

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Jae-Hyun Kim¹, Ji-Hoon Jung¹, Xue Zhang², Ji-Ho Park², Jaehoon Park², and Jin-Hyuk Bae¹
¹Kyungpook National University, Korea, ²Hallym University, Korea

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Young Joon Yoon, Ji-Yun Seon, Chang-Yeoul Kim, and Hyo Tae Kim
Korea Institute of Ceramic Engineering and Technology, Korea
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Hee Yeon Yang\textsuperscript{1,2}, Dong Yeol Yun\textsuperscript{1}, Yu Na Kim\textsuperscript{1}, Jung Ah Lim\textsuperscript{2}, Jae-Min Hong\textsuperscript{2}, and Tae Whan Kim\textsuperscript{1}
\textsuperscript{1}(Hanyang University, Korea, \textsuperscript{2}Korea Institute of Science and Technology, Korea

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Sang-Heon Lee\textsuperscript{1} and Yong Choi\textsuperscript{2}
\textsuperscript{1}Sunmoon University, Korea, \textsuperscript{2}Dankook University, Korea
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Ho-Beom Kwon, Do-Hyoung Kim, Hee Young Lee, and Jai-Yeoul Lee  
*Yeungnam University, Korea*

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\(^1\)Korea Research Institute of Chemical Technology, Korea, \(^2\)Yonsei University, Korea

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*Sunchon National University, Korea*

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Shin Kim, Jae-Kwan Kim, and Ji-Myon Lee  
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¹*Sunchon National University, Korea, ²Kongju National University, Korea*

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¹*Hanbat National University, Korea, ²Korea Institute of Materials Science, Korea*

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D. A. Hakeem, H. Kim, J. S. Cha, and K. Park  
*Sejong University, Korea*
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**Electrochemical Investigation of Thin Film Prepared by PVD Method for Marine Application**  
Jung-Hyung Lee and Seong-Jong Kim  
*Mokpo Maritime University, Korea*

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**The Characterization of Hot Formability and Transformation Temperatures in Ti-Ni-Hf and Ti-Ni-Hf-Zr Alloys**  
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**(Sb)/Cu²Sb-TiC-C Composite Anode for High-performance Sodium-ion Batteries**  
Jaehyun Hur and Il Tae Kim  
*Gachon University, Korea*