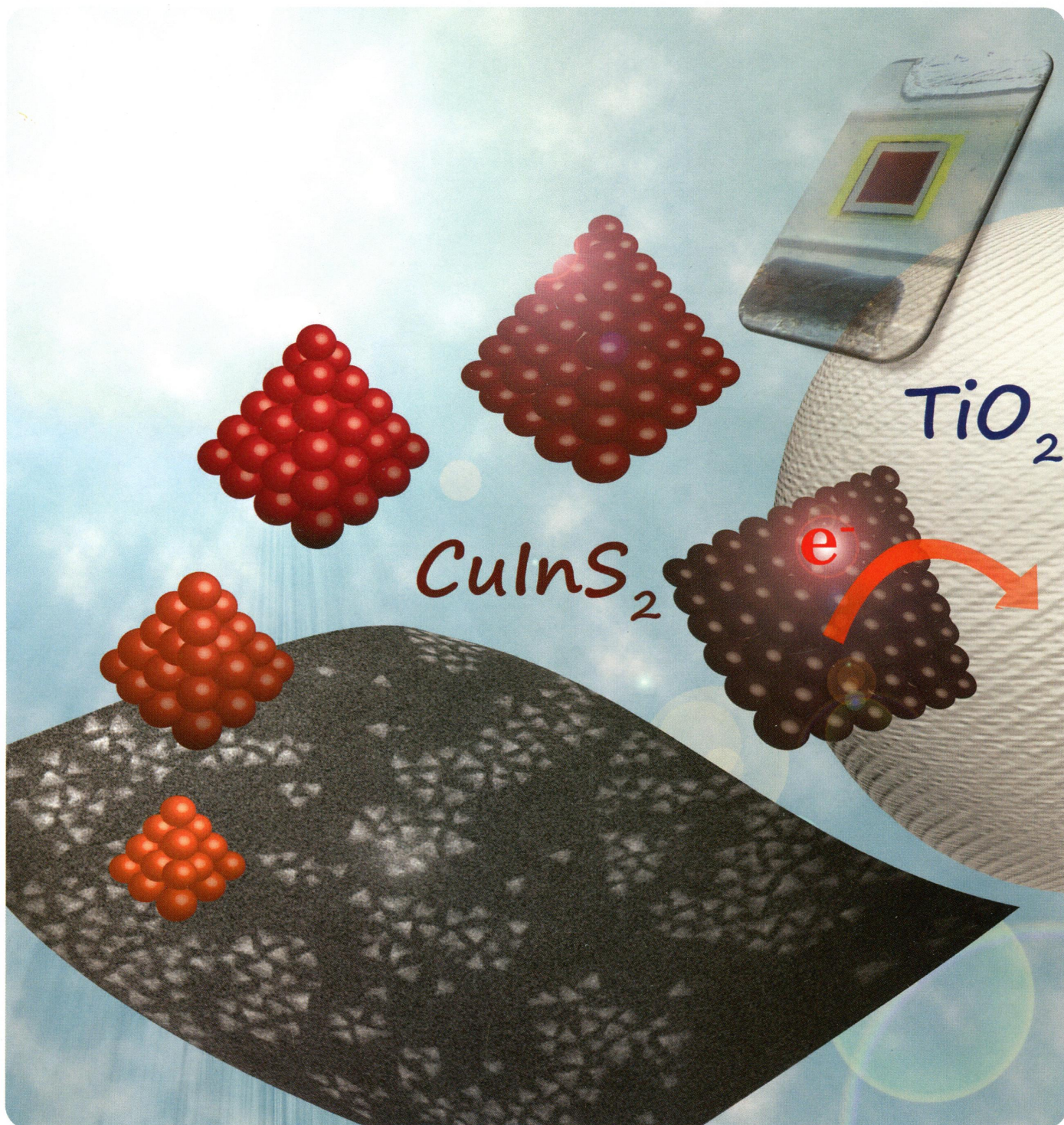


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**ON THE COVER:**  $\text{CuInS}_2$  quantum dots with pyramidal shape display size-dependent photovoltaic performance. The origin of the photocurrent was found to arise from defect states, and an optimal size was identified based on charge stabilization. For more information, see "Size-Dependent Photovoltaic Performance of  $\text{CuInS}_2$  Quantum Dot-Sensitized Solar Cells" by Danilo H. Jara, Seog Yoon Yoon, Kevin G. Stamplecoskie, and Prashant V. Kamat\* (*Chem. Mater.* **2014**, *26*, 7221–7228).

## Editorial

6905

**Looking Back: Recap of 2014 at Chemistry of Materials**

Jillian M. Buriak

DOI: 10.1021/cm504393f

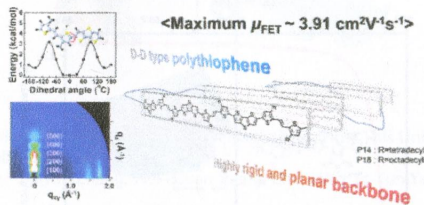
## Communications

6907

DOI: 10.1021/cm502486n

**New Donor–Donor Type Copolymers with Rigid and Coplanar Structures for High-Mobility Organic Field-Effect Transistors**

Soo-Young Jang, In-Bok Kim, Jihong Kim, Dongyoon Khim, Eunhwan Jung, Boseok Kang, Bogyu Lim, Yeong-A Kim, Yun Hee Jang, Kilwon Cho, and Dong-Yu Kim\*

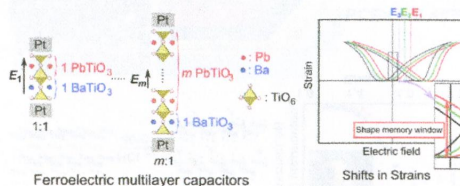


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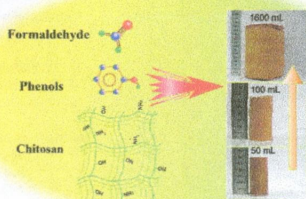
**Imprint Control of Nonvolatile Shape Memory with Asymmetric Ferroelectric Multilayers**

Woo-Hee Kim, Jong Yeog Son,\* Young-Han Shin,\* and Hyun Myung Jang



## General and Straightforward Synthetic Route to Phenolic Resin Gels Templated by Chitosan Networks

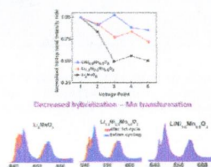
Zhi-Long Yu, Zhen-Yu Wu, Sen Xin, Chan Qiao, Zi-You Yu, Huai-Ping Cong, and Shu-Hong Yu\*



## Articles

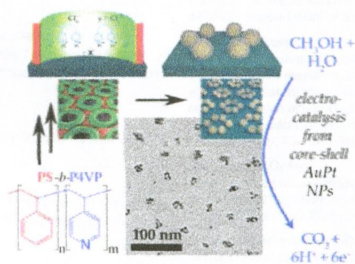
Understanding the Role of Ni in Stabilizing the Lithium-Rich High-Capacity Cathode Material  $\text{Li}[\text{Ni}_x\text{Li}_{(1-2x)/3}\text{Mn}_{(2-x)/3}]\text{O}_2$  ( $0 \leq x \leq 0.5$ )

Sunny Hy, Ju-Hsiang Cheng, Jyong-Yue Liu, Chun-Jern Pan, John Rick, Jyh-Fu Lee, Jin-Ming Chen, and Bing Joe Hwang\*



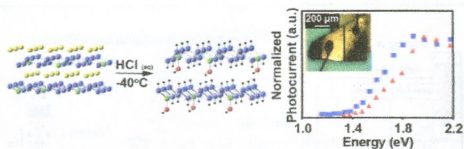
## Block Copolymer Templated Synthesis of Core-Shell PtAu Bimetallic Nanocatalysts for the Methanol Oxidation Reaction

Kyle Mikkelsen, Blake Cassidy, Nicole Hofstetter, Leah Bergquist, Audrey Taylor, and David A. Rider\*



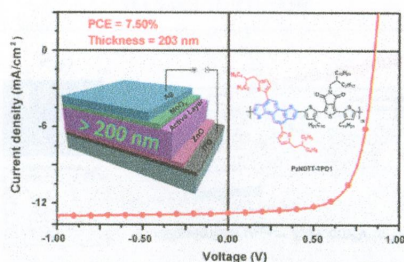
### Synthesis and Stability of Two-Dimensional Ge/Sn Graphane Alloys

Maxx Q. Arguilla, Shishi Jiang, Basant Chitara, and Joshua E. Goldberger\*



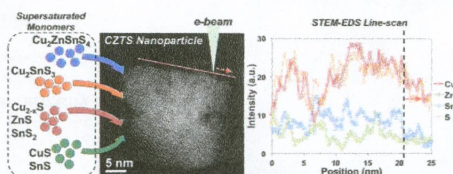
### Naphtho[1,2-b:5,6-b']dithiophene Based Two-Dimensional Conjugated Polymers for Highly Efficient Thick-Film Inverted Polymer Solar Cells

Xiangwei Zhu, Jin Fang, Kun Lu,\* Jianqi Zhang, Lingyun Zhu, Yifan Zhao, Zhigang Shuai, and Zhixiang Wei\*



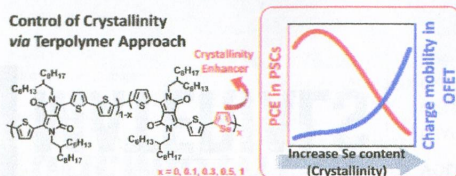
### Compositional Inhomogeneity of Multinary Semiconductor Nanoparticles: A Case Study of Cu<sub>2</sub>ZnSnS<sub>4</sub>

Wei-Chang Yang, Caleb K. Miskin, Nathaniel J. Carter, Rakesh Agrawal,\* and Eric A. Stach\*



### Determining Optimal Crystallinity of Diketopyrrolopyrrole-Based Terpolymers for Highly Efficient Polymer Solar Cells and Transistors

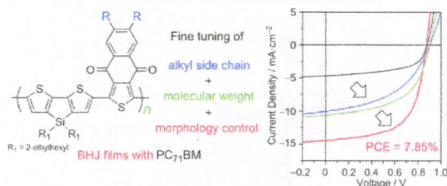
Ki-Hyun Kim, Sunhee Park, Hojeong Yu, Hyunbum Kang, Inho Song, Joon Hak Oh, and Bumjoon J. Kim\*





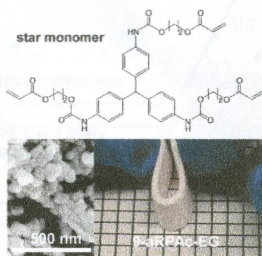
### Enhanced Photovoltaic Performance of Amorphous Copolymers Based on Dithienosilole and Dioxocycloalkene-annulated Thiophene

Jianming Huang, Yutaka Ie,\* Makoto Karakawa, Masahiko Saito, Itaru Osaka, and Yoshio Aso\*



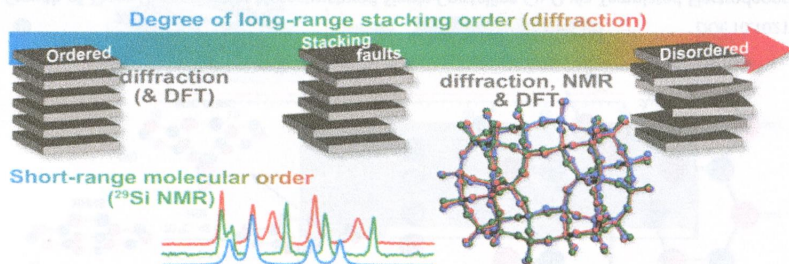
### Flexible Aerogels from Hyperbranched Polyurethanes: Probing the Role of Molecular Rigidity with Poly(Urethane Acrylates) Versus Poly(Urethane Norbornenes)

Abhishek Bang, Clayton Buback, Chariklia Sotiriou-Leventis,\* and Nicholas Leventis\*



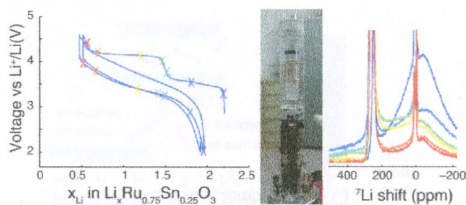
### Long- and Short-Range Constraints for the Structure Determination of Layered Silicates with Stacking Disorder

Sylvian Cadars,\* Mathieu Allix, Darren H. Brouwer, Ramzy Shayib, Matthew Sucomel, Mounesha N. Garaga, Aydar Rakhmatullin, Allen W. Burton, Stacey I. Zones, Dominique Massiot, and Bradley F. Chmelka



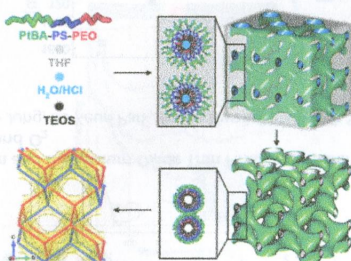
### Solid-State NMR of the Family of Positive Electrode Materials $\text{Li}_2\text{Ru}_{1-x}\text{Sn}_x\text{O}_3$ for Lithium-Ion Batteries

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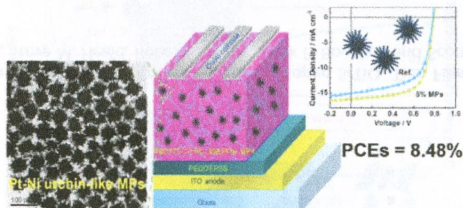
### Synthesis and Characterization of Macroporous Photonic Structure that Consists of Azimuthally Shifted Double-Diamond Silica Frameworks

Lu Han, Dongpo Xu, Ye Liu, Tetsu Ohsuna,\* Yuan Yao, Chun Jiang,\* Yiyong Mai, Yuanyuan Cao, Yingying Duan, and Shunai Che\*



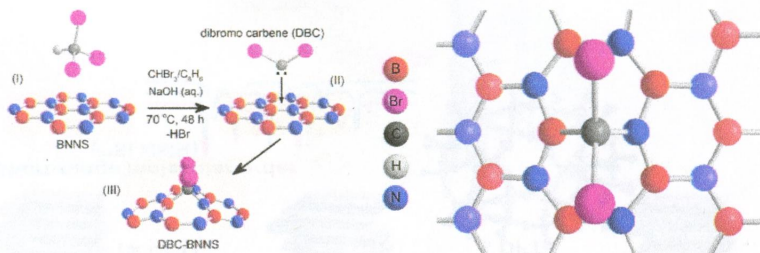
### Strategic Design of Three-Dimensional (3D) Urchin-Like Pt–Ni Nanoalloys: How This Unique Nanostructure Boosts the Bulk Heterojunction Polymer Solar Cells Efficiency to 8.48%

Shang-Wei Chou, Hsieh-Chih Chen,\* Zhiyun Zhang, Wei-Hsuan Tseng, Chih-I Wu, Ya-Yun Yang, Ching-Yen Lin, and Pi-Tai Chou\*



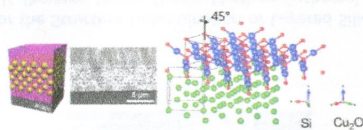
### Dibromocarbene Functionalization of Boron Nitride Nanosheets: Toward Band Gap Manipulation and Nanocomposite Applications

Toby Sainsbury,\* Arlene O'Neill, Melissa K. Passarelli, Maud Seraffon, Dipak Gohil, Sam Gnaniyah, Steve J. Spencer, Alasdair Rae, and Jonathan N. Coleman



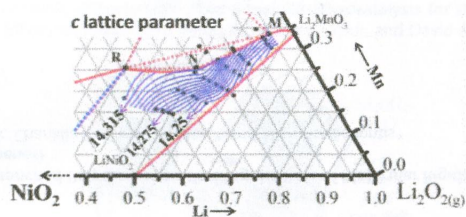
### Epitaxial Growth of Three-Dimensionally Mesostructured Single-Crystalline $\text{Cu}_2\text{O}$ via Templated Electrodeposition

Jinwoo Kim, Ha Seong Kim, Jun Hee Choi, Hyeongtag Jeon, Yohan Yoon, Jinyun Liu, Jea-Gun Park, and Paul V. Braun\*



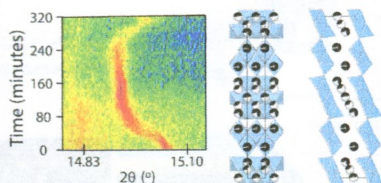
### Structural and Electrochemical Study of the Li–Mn–Ni Oxide System within the Layered Single Phase Region

Jing Li, John Camardese, Stephen Glazier, and J. R. Dahn\*



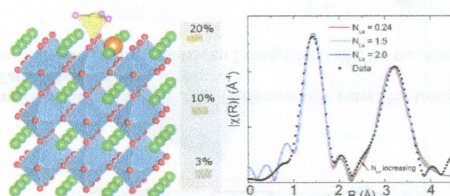
### Synthetic, Structural, and Electrochemical Study of Monoclinic $\text{Na}_4\text{Ti}_5\text{O}_{12}$ as a Sodium-Ion Battery Anode Material

Pierre J. P. Naeyaert, Maxim Avdeev, Neeraj Sharma, Hamdi Ben Yahia, and Chris D. Ling\*



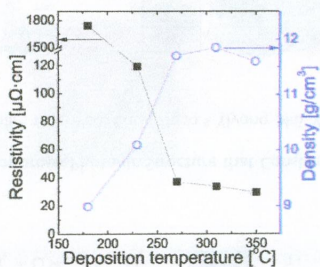
### Band-Gap Reduction and Dopant Interaction in Epitaxial La,Cr Co-doped $\text{SrTiO}_3$ Thin Films

Ryan B. Comes, Peter V. Sushko, Steve M. Heald, Robert J. Colby, Mark E. Bowden, and Scott A. Chambers\*



### Atomic Layer Deposition of Ruthenium and Ruthenium Oxide Thin Films from a Zero-Valent (1,5-Hexadiene)(1-isopropyl-4-methylbenzene)ruthenium Complex and $\text{O}_2$

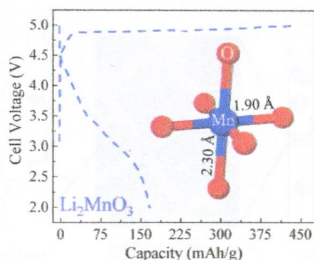
Hyo Jun Jung, Jeong Hwan Han, Eun Ae Jung, Bo Keun Park, Jin-Ha Hwang, Seung Uk Son, Chang Gyoung Kim, Taek-Mo Chung,\* and Ki-Seok An\*



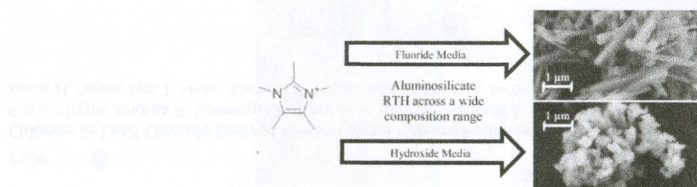


**First-Cycle Evolution of Local Structure in Electrochemically Activated  $\text{Li}_2\text{MnO}_3$** 

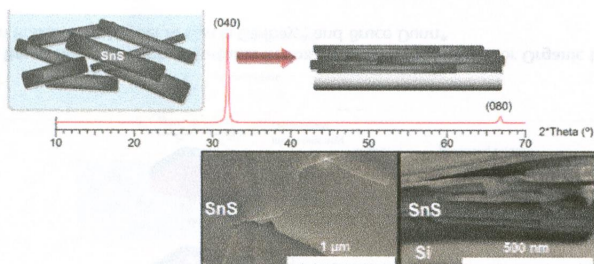
Jason R. Croy, Joong Sun Park, Fulya Dogan, Christopher S. Johnson, Baris Key, and Mahalingam Balasubramanian\*

**Facile Preparation of Aluminosilicate RTH across a Wide Composition Range Using a New Organic Structure-Directing Agent**

Joel E. Schmidt, Mark A. Deimund, and Mark E. Davis\*

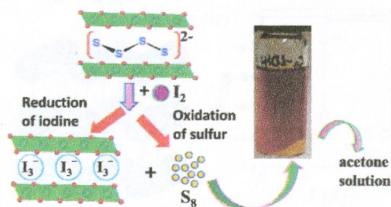
**Highly Textured Tin(II) Sulfide Thin Films Formed from Sheetlike Nanocrystal Inks**

Steven M. Herron, Jukka T. Tanskanen, Katherine E. Roelofs, and Stacey F. Bent\*



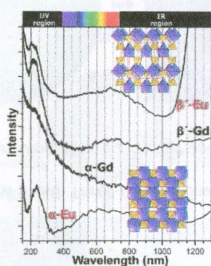
### Highly Efficient Iodine Capture by Layered Double Hydroxides Intercalated with Polysulfides

Shulan Ma, Saiful M. Islam, Yurina Shim, Qingyang Gu, Pengli Wang, Hao Li, Genban Sun, Xiaojing Yang, and Mercuri G. Kanatzidis\*



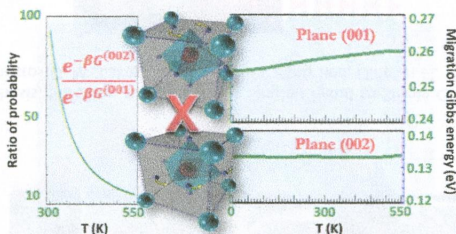
### Crystal Structure and Luminescent Properties of $R_{2-x}Eu_x(MoO_4)_3$ (R = Gd, Sm) Red Phosphors

Vladimir A. Morozov, Maria V. Raskina, Bogdan I. Lazoryak, Katrien W. Meert, Katleen Korthout, Philippe F. Smet, Dirk Poelman, Nicolas Gauquelin, Johan Verbeeck, Artem M. Abakumov, and Joke Hadermann\*



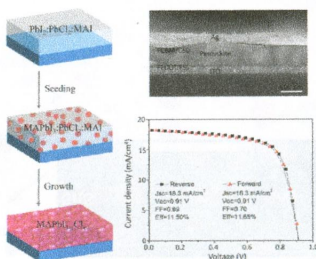
### Concentration of Charge Carriers, Migration, and Stability in $Li_3OCl$ Solid Electrolytes

Rodolpho Mouta, Maria Águda B. Melo, Eduardo M. Diniz, and Carlos William A. Paschoal\*



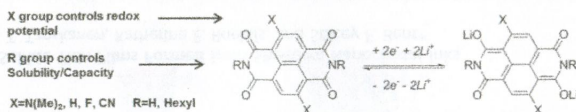
### Reproducible One-Step Fabrication of Compact MAPb<sub>1-3</sub>Cl<sub>x</sub> Thin Films Derived from Mixed-Lead-Halide Precursors

Dong Wang, Zhihong Liu, Zhongmin Zhou, Huimin Zhu, Yuanyuan Zhou, Changshui Huang, Zaiwei Wang, Hongxia Xu, Yizheng Jin, Bin Fan, Shuping Pang,\* and Guanglei Cui\*



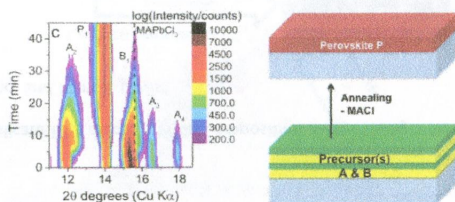
### Naphthalene Diimide Based Materials with Adjustable Redox Potentials: Evaluation for Organic Lithium-Ion Batteries

Geeta S. Vadehra, Ryan P. Maloney, Miguel A. Garcia-Garibay,\* and Bruce Dunn\*



### Chloride in Lead Chloride-Derived Organo-Metal Halides for Perovskite-Absorber Solar Cells

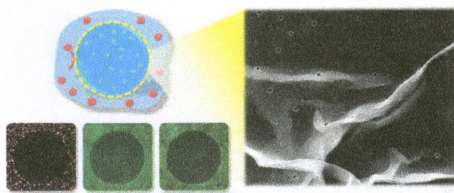
Eva L. Unger, Andrea R. Bowring, Christopher J. Tassone, Vanessa L. Pool, Aryeh Gold-Parker, Rongrong Cheacharoen, Kevin H. Stone, Eric T. Hoke, Michael F. Toney, and Michael D. McGehee\*



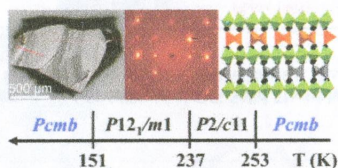


**Perforated Microcapsules with Selective Permeability Created by Confined Phase Separation of Polymer Blends**

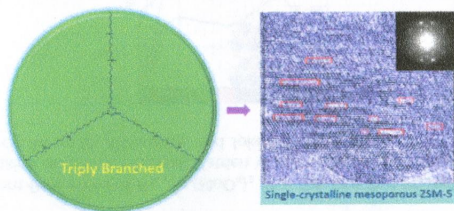
Bomi Kim, Tae Yong Lee, Alireza Abbaspourrad, and Shin-Hyun Kim\*

**Brownmillerite  $\text{Ca}_2\text{Co}_2\text{O}_5$ : Synthesis, Stability, and Re-entrant Single Crystal to Single Crystal Structural Transitions**

Junjie Zhang,\* Hong Zheng, Christos D. Malliakas, Jared M. Allred, Yang Ren, Qing'an Li, Tian-Heng Han, and J.F. Mitchell

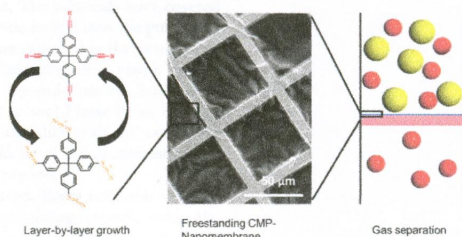
**Synthesis of Single-Crystalline Mesoporous ZSM-5 with Three-Dimensional Pores via the Self-Assembly of a Designed Triply Branched Cationic Surfactant**

Bhupendra K. Singh, Dongdong Xu, Lu Han, Jian Ding, Yimeng Wang,\* and Shunai Che\*

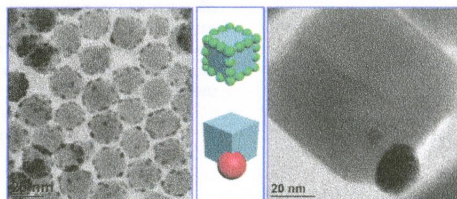


**Preparation of Freestanding Conjugated Microporous Polymer Nanomembranes for Gas Separation**

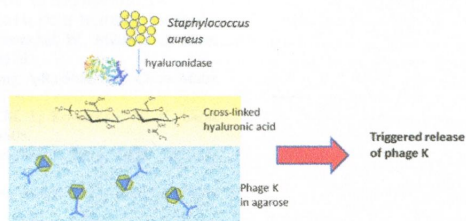
Peter Lindemann, Manuel Tsotsalas,\* Sergey Shishatskiy, Volker Abetz, Peter Krolla-Sidenstein, Carlos Azucena, Laure Monnereau, André Beyer, Armin Götzhäuser, Veronica Mugnaini, Hartmut Gliemann, Stefan Bräse, and Christof Wöll

**Au-SnS Hetero Nanostructures: Size of Au Matters**

Biplab K. Patra, Amit K. Guria, Anirban Dutta, Arnab Shit, and Narayan Pradhan\*

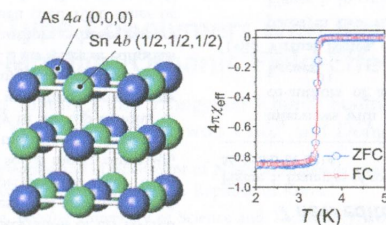
**Triggered Release of Bacteriophage K from Agarose/Hyaluronan Hydrogel Matrixes by *Staphylococcus aureus* Virulence Factors**

Jessica E. Bean, Diana R. Alves, Maisem Laabei, Patricia P. Esteban, Naing Tun Thet, Mark C. Enright, and A. Toby A. Jenkins\*



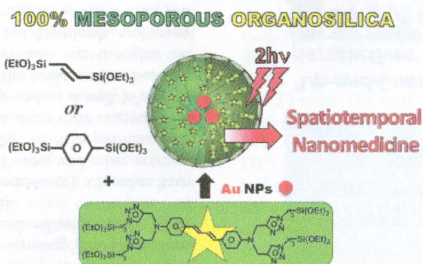
### SnAs with the NaCl-type Structure: Type-I Superconductivity and Single Valence State of Sn

Yue Wang, Hikaru Sato, Yoshitake Toda, Shigenori Ueda, Hidenori Hiramatsu,\* and Hideo Hosono\*



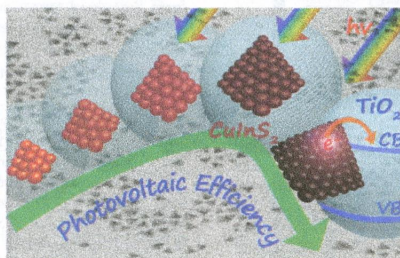
### Mixed Periodic Mesoporous Organosilica Nanoparticles and Core–Shell Systems, Application to in Vitro Two-Photon Imaging, Therapy, and Drug Delivery

Jonas Croissant, Damien Salles, Marie Maynadier, Olivier Mongin, Vincent Hugues, Mireille Blanchard-Desce,\* Xavier Cattoën, Michel Wong Chi Man, Audrey Gallud, Marcel Garcia, Magali Gary-Bobo,\* Laurence Raehm, and Jean-Olivier Durand\*



### Size-Dependent Photovoltaic Performance of $\text{CuInS}_2$ Quantum Dot-Sensitized Solar Cells

Danilo H. Jara, Seog Joon Yoon, Kevin G. Stamplecoskie, and Prashant V. Kamat\*





**Controlling the Thermoelectric Properties of Thiophene-Derived Single-Molecule Junctions**

William B. Chang, Cheng-Kang Mai, Michele Kotiuga, Jeffrey B. Neaton, Guillermo C. Bazan, and Rachel A. Segalman\*

