The merit of perovskite's dimensionality; can this replace the 3D halide perovskite?

*Energy Environ. Sci.*, 2017, Accepted Manuscript

**DOI**: 10.1039/C7EE03397D, Perspective

Lioz Etgar

This perspective paper focuses on the dimensionality of organic-inorganic halide perovskite and its relevant advantages over 3D perovskite. The charges in two-dimensional (2D) materials are restricted in their movement to...

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Dissolution, Migration, and Deposition of Transition Metal Ions in Li-ion Batteries Examined by Mn-based cathodes - a Critical Review

*Energy Environ. Sci.*, 2017, Accepted Manuscript

**DOI**: 10.1039/C7EE03122J, Review Article

Chun Zhan, Tianpin Wu, Jun Lu, Khalil Amine

Unlike the revolutionary advances in anodes of the lithium ion batteries from Li intercalation materials to Li alloy and/or conversion reaction materials, the development of the cathode is still dominated...

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Extremely lightweight and ultra-flexible infrared light converting quantum dot solar cells with high power-per-weight output using a solution-processed bending durable silver nanowire based electrode

*Energy Environ. Sci.*, 2017, Accepted Manuscript

**DOI**: 10.1039/C7EE02772A, Paper

Xiaoliang Zhang, Viktor A. Oberg, Juan Du, Jianhua Liu, Erik M. J. Johansson

Lightweight and flexible solar cells are highly interesting for new applications, such as in spacecraft, aircraft and personal pack load. PbS colloidal quantum dots (CQDs) have a broad and strong...

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An electrochemical cell with Gortex-based electrodes capable of extracting pure hydrogen from highly dilute hydrogen-methane mixtures


**DOI**: 10.1039/C7EE02236K, Paper

Klaudia Wagner, Prerna Tiwari, Gerhard F. Swiegers, Gordon G. Wallace

In this work we report a novel liquid-acid electrochemical cell containing Gortex-based gas diffusion electrodes, layered with suitable catalysts and current collectors, that is capable of sustainably extracting pure hydrogen from methane mixtures containing as little as 5% hydrogen.
Constructing canopy-shaped molecular architectures to create local Pt surface sites with high tolerance to H2S and CO for hydrogen electrooxidation

DOI: 10.1039/C7EE02641B, Paper
Tao Wang, Zhi-Xin Chen, Song Yu, Tian Sheng, Hai-Bin Ma, Lu-Ning Chen, Muhammad Rauf, Hai-Ping Xia, Zhi-You Zhou, Shi-Gang Sun
Pt surface is modified with 2,6-diacetylpyridine, which exhibits high H2S and CO tolerance for H2 oxidation through steric hindrance.

Unprecedented Size-Sieving Ability in Polybenzimidazole Doped with Polyprotic Acids for Membrane H2/CO2 Separation

*Energy Environ. Sci.*, 2017, Accepted Manuscript
DOI: 10.1039/C7EE02865B, Communication
Lingxiang Zhu, Mark T. Swihart, Haiqing Lin
Polymers with efficient and tight chain-packing and thus strong size-sieving ability are of great interest for H2/CO2 separation. Herein, we demonstrate a new approach to manipulating polymer structure by acid...

A specific demetalation of Fe-N4 catalytic sites in the micropores of NC_Ar+NH3 is at the origin of the initial activity loss of this highly active Fe/N/C catalyst used for the reduction of oxygen in PEM fuel cell

*Energy Environ. Sci.*, 2017, Accepted Manuscript
DOI: 10.1039/C7EE02302B, Paper
Regis Chenitz, Ulrike Ingrid Kramm, Michel Lefevre, Vassili Glibin, Gaixia Zhang, Shuhui Sun, Jean-Pol Dodelet
In this work, we explore the behavior of NC_Ar+NH3, an initially highly active catalyst for oxygen electroreduction, in H2/Air fuel cells from 0.8 to 0.2V and at 80 and 250°C,
Designing high performance all-small molecule solar cells with non-fullerene acceptors: comprehensive studies on photoexcitation dynamics and charge separation kinetics

*Energy Environ. Sci.*, 2017, Accepted Manuscript

DOI: 10.1039/C7EE02967E, Paper

Junqing Shi, Anna Isakova, Abasi Abudulimu, Marius van den Berg, Oh Kyu Kwon, Alfred J. Meixner, Soo Young Park, Dai Zhang, Johannes Gierschner, Larry Luer

Solution-processable all-small-molecule organic solar cells (OSC) have shown a dramatic progress in improving stability and photovoltaic efficiency. However, knowledge of photoexcitation dynamics in this novel class of materials is very...

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Na11Sn2PS12: a new solid state sodium superionic conductor


DOI: 10.1039/C7EE03083E, Communication

Z. Zhang, E. Ramos, F. Lalere, A. Assoud, K. Kaup, P. Hartman, Linda F. Nazar

Elucidation of the structure of a new sodium superionic conductor, Na\textsubscript{11}Sn\textsubscript{2}PS\textsubscript{12} via single crystal XRD and AIMD simulations reveal isotropic 3D Na\textsuperscript{+}-ion conduction pathways.

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Enhanced charge carrier mobility and lifetime suppress hysteresis and improve efficiency in planar perovskite solar cells
Planar perovskite solar cells yield efficiency of over 20%.

Hybrid solid electrolytes, composed of 3D ordered bicontinuous conducting ceramic and insulating polymer microchannels are reported. The ceramic channels provide continuous, uninterrupted pathways, maintaining high ionic conductivity between the electrodes,...

A novel solar water-energy nexus technology is presented that combines the solar desalination of saline water and desalination-driven wastewater remediation coupled with the production of H₂.

CO₂ enhanced oil recovery: a catalyst for gigatonne-scale carbon capture and storage deployment?
Energy Environ. Sci., 2017, 10, 2594-2608
DOI: 10.1039/C7EE02102J, Paper
Clea Kolster, Mohammad S. Masnadi, Samuel Krevor, Niall Mac Dowell, Adam R. Brandt
Using carbon dioxide for enhanced oil recovery (CO₂-EOR) has been widely cited as a potential catalyst for gigatonne-scale carbon capture and storage (CCS) deployment.
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High thermoelectric performance of p-BiSbTe compounds prepared by ultra-fast thermally induced reaction

Energy Environ. Sci., 2017, 10, 2638-2652
DOI: 10.1039/C7EE02677C, Paper
Gang Zheng, Xianli Su, Hongyao Xie, Yuejiao Shu, Tao Liang, Xiaoyu She, Wei Liu, Yonggao Yan, Qingjie Zhang, Ctirad Uher, Mercouri G. Kanatzidis, Xinfeng Tang
High performance Bi₂Te₃-based thermoelectric material and modules with a conversion efficiency of 5.2% under a temperature gradient of 250 K were synthesized by TIFS.
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Sulfide perovskites for solar energy conversion applications: computational screening and synthesis of the selected compound LaYS₃


**Energy Environ. Sci., 2017, 10, 2579-2593**  
DOI: 10.1039/C7EE02702H, Paper  
Korina Kuhar, Andrea Crovetto, Mohnish Pandey, Kristian S. Thygesen, Brian Seger, Peter C. K. Vesborg, Ole Hansen, Ib Chorkendorff, Karsten W. Jacobsen  
Identification and synthesis of a new large-band gap photoabsorber for tandem-architecture water splitting: LaYS₃.  
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**On the climate change mitigation potential of CO₂ conversion to fuels**

**Energy Environ. Sci., 2017, 10, 2491-2499**  
DOI: 10.1039/C7EE02819A, Perspective  
J. Carlos Abanades, Edward S. Rubin, Marco Mazzotti, Howard J. Herzog  
Proposed utilization schemes producing liquid fuels from captured CO₂ offer fewer climate mitigation benefits at higher costs than alternative systems.  
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**Towards identifying the active sites on RuO₂(110) in catalyzing oxygen evolution**
Surface structural transitions and active sites are identified using X-ray scattering and density functional theory.
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A stable 3 V all-solid-state sodium-ion battery based on a closo-borate electrolyte

Energy Environ. Sci., 2017, 10, 2609-2615
DOI: 10.1039/C7EE02420G, Paper
L. Duchene, R.-S. Kuhnel, E. Stilp, E. Cuervo Reyes, A. Remhof, H. Hagemann, C. Battaglia
We report on a particularly stable 3 V all-solid-state sodium-ion battery built using a closo-borate based electrolyte, namely Na₂(B₁₂H₁₂)₀.₅(B₁₀H₁₀)₀.₅.
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An efficient organic magnesium borate-based electrolyte with non-nucleophilic characteristics for magnesium-sulfur battery
An efficient organic magnesium borate-based electrolyte with non-nucleophilic characteristics for magnesium-sulfur battery.

Electro-synthesis of ammonia from nitrogen at ambient temperature and pressure in ionic liquids

High faradaic efficiency reduction of N₂ to NH₃ is achieved in ionic liquid media under ambient conditions.