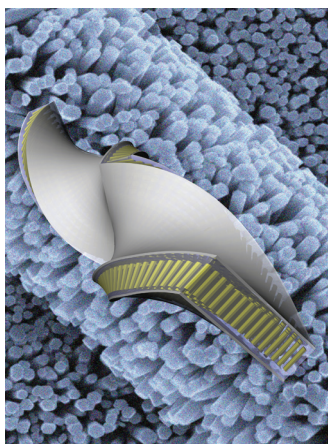


ADVANCED FUNCTIONAL MATERIALS

www.afm-journal.de

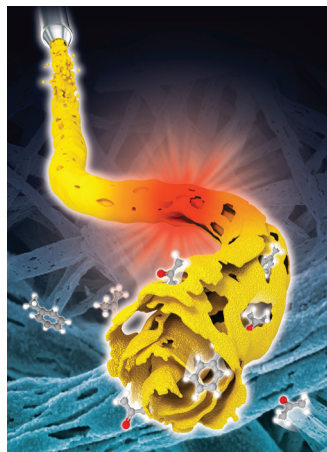


Energy Harvesting Materials

To construct super-flexible and conformable nanogenerators, ZnO nanowires are grown on 18- μm -thick Al foil, which is used as both the electrode and the substrate. Coating the Al foil with poly(methyl methacrylate) before the growth of ZnO nanowires results in a high-throughput process due to complete insulation between the as-grown ZnO nanowires and the Al foil. As reported by Zhong Lin Wang and co-workers on page 2445, this super-flexible nanogenerator shows potential as an energy harvester from a waving flag and as a self-powered sensor for detecting skin movement.

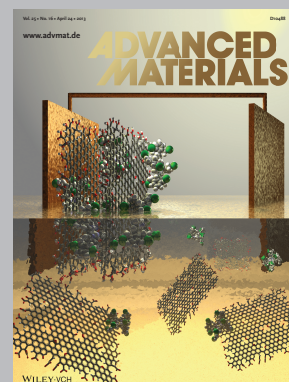
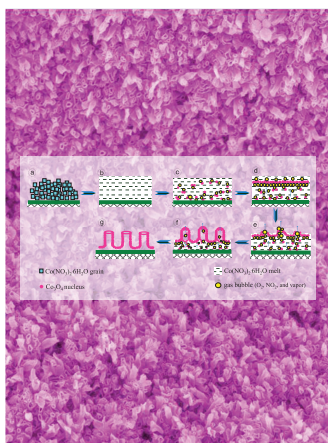
Sensors

Thin-wall assembled SnO_2 tubes with a number elongated pores are synthesized via electrospinning, controlled by the variation of flow rates. On page 2357, Il-Doo Kim and co-workers report that these highly porous SnO_2 tubes show a five-fold higher acetone response compared with dense SnO_2 fiber in a humid atmosphere that is similar to the oral cavity. The accurate detection of acetone gas in exhaled breath can provide useful information for real-time diagnosis of diabetes.



Nanotube Arrays

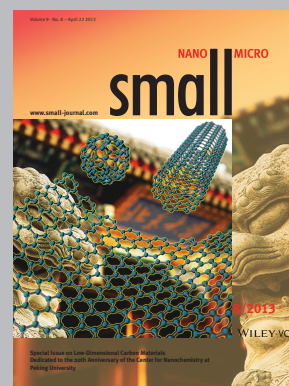
The simple, versatile, and large-scale fabrication of vertically aligned nanotube arrays (NTAs) is achieved by regulating the gas bubbles in situ generated from the thermal decomposition of melted salts. On page 2406, Jianguo Guan and co-workers report that as-obtained Co_3O_4 NTAs show unique magnetic properties and significantly enhanced electrochemical activity, and are promising for magnetic recording media, magnetic shielding, lithium-ion batteries, and chemical sensing.



Advanced Materials has been bringing you the best in materials research for over twenty years.

With its increased ISI Impact Factor of 13.877, *Advanced Materials* is one of the most influential journals in the field. Publishing every week, *Advanced Materials* now brings you even more of the latest results at the cutting edge of materials science.

www.advmat.de



Small is the very best interdisciplinary forum for all experimental and theoretical aspects of fundamental and applied research at the micro and nano length scales.

With an ISI impact Factor of 8.349 and publishing every two weeks in 2013 with papers online in advance of print, *Small* is your first-choice venue for top-quality communications, detailed full papers, cutting-edge concepts, and in-depth reviews of all things micro and nano.

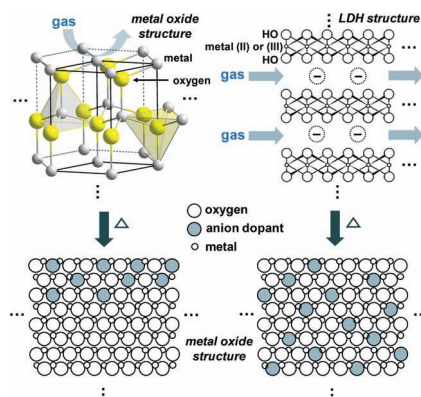
www.small-journal.com

FULL PAPERS

Photocatalysts

S. Cho, J.-W. Jang, K.-j. Kong, E. S. Kim,
K.-H. Lee,* J. S. Lee*2348–2356

Anion-Doped Mixed Metal Oxide Nanostructures Derived from Layered Double Hydroxide as Visible Light Photocatalysts

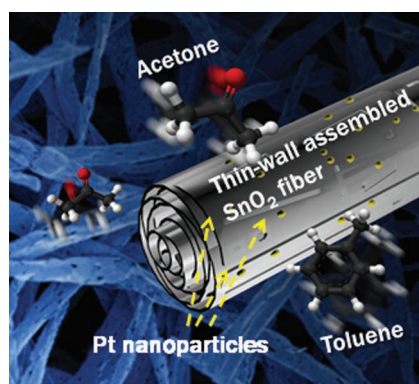


The interlayer gallery of layered double hydroxides allows effective access of anion precursors to their crystal lattice for uniform carbon and nitrogen doping, which yields anion-doped mixed metal oxide nanostructures with an excellent visible light photocatalytic activity. The visible light absorption caused by the anion doping contributes to the photocatalytic activity.

Sensors

J. Shin, S.-J. Choi, I. Lee, D.-Y. Youn,
C. O. Park, J.-H. Lee, H. L. Tuller,
I.-D. Kim*2357–2367

Thin-Wall Assembled SnO_2 Fibers Functionalized by Catalytic Pt Nanoparticles and their Superior Exhaled-Breath-Sensing Properties for the Diagnosis of Diabetes

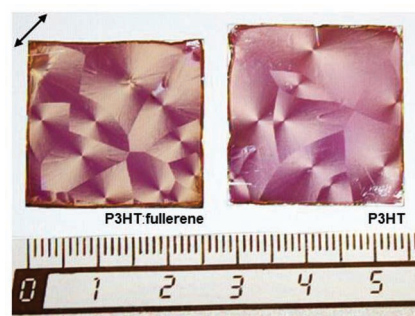


Electrospun fibers with wrinkled SnO_2 walls composed of a number of elongated openings and pores are synthesized by a microphase separation controlled by the variation of flow rates. The unique structure enables superior acetone sensing performance due to the open pore structure, which provides fast transport and penetration of exhaled gases into the entire sensing layers.

Polymer Semiconductors

C. Müller,* M. Aghamohammadi,
S. Himmelberger, P. Sonar,
M. Garriga, A. Salles,
M. Campoy-Quiles2368–2377

One-Step Macroscopic Alignment of Conjugated Polymer Systems by Epitaxial Crystallization during Spin-Coating

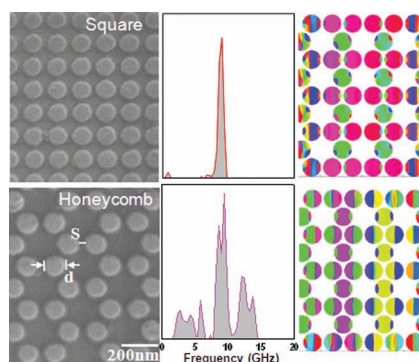


Macroscopic spherulite-like structures of the conjugated polymer poly(3-hexylthiophene) (P3HT) grow directly during spin-coating. This is achieved by processing P3HT or P3HT:fullerene bulk heterojunction blends from a mixture of the crystallizable solvent 1,3,5-trichlorobenzene and a second carrier solvent such as chlorobenzene. Epitaxial growth of the polymer on solidified solvent crystals gives rise to circular-symmetric, spherulite-like structures that feature a high degree of anisotropy.

Magnonics

S. Saha, R. Mandal, S. Barman,
D. Kumar, B. Rana, Y. Fukuma,
S. Sugimoto, Y. Otani,
A. Barman*2378–2386

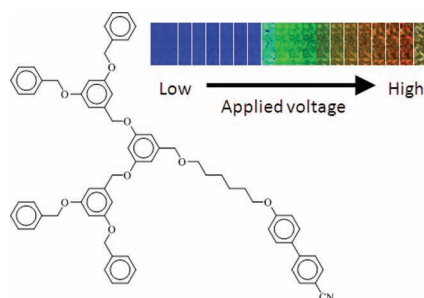
Tunable Magnonic Spectra in Two-Dimensional Magnonic Crystals with Variable Lattice Symmetry



Tunable magnonic spectra in two-dimensional magnonic crystals with variable lattice symmetry are studied using an all-optical time-resolved magneto-optical Kerr microscope. The magnonic mode profiles are interpreted in different lattices by micromagnetic simulations. A six-fold anisotropy is observed in the hexagonal lattice due to the variation of the magnetostatic stray field on the elements.

FULL PAPERS

Liquid crystalline blue phases have great potential for advanced applications in tunable photonic devices. A new material system is developed with a dendron molecule, simultaneously enabling both the enlargement of the temperature range of thermodynamically stable blue phases and the continuously reversible maximum shift range of Bragg reflection in a visible wavelength region under an electric field.

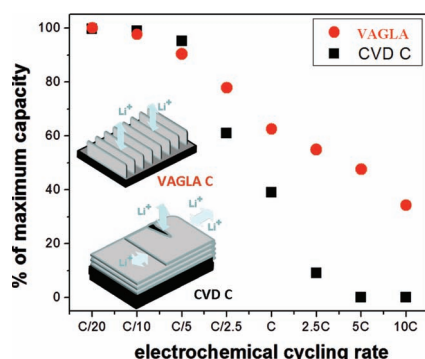


Liquid Crystals

S. Shibayama, H. Higuchi, Y. Okumura, H. Kikuchi*2387–2396

Dendron-Stabilized Liquid Crystalline Blue Phases with an Enlarged Controllable Range of the Photonic Band for Tunable Photonic Devices

Engineering of graphene layer orientations to obtain vertically aligned graphene layer based thin-film electrodes (*a*-axis oriented graphitic carbon film) for Li-ion batteries leads to considerably improved specific capacity at higher electrochemical cycling rates (improved rate capability), as compared to the more usual *c*-axis oriented graphitic carbon films.

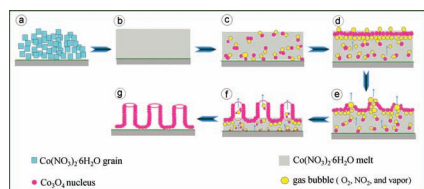


Lithium-Ion Batteries

A. Mukhopadhyay, F. Guo, A. Tokranov, X. Xiao, R. H. Hurt, B. W. Sheldon*2397–2404

Engineering of Graphene Layer Orientation to Attain High Rate Capability and Anisotropic Properties in Li-Ion Battery Electrodes

A versatile gas bubble-induced self-assembly technique based on thermal decomposition of $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ on a flat substrate is developed for the novel one-step fabrication of vertically aligned arrays of Co_3O_4 nanotubes, which show unique magnetic properties and enhanced electrochemical activity, and thus have promising applications in magnetic shielding, energy storage, etc.

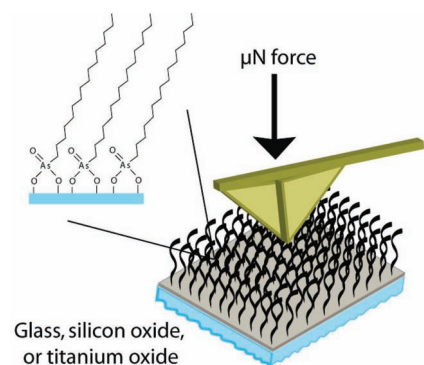


Self-Assembly

G. X. Tong, J. G. Guan,* Q. J. Zhang2406–2414

In Situ Generated Gas Bubble-Directed Self-Assembly: Synthesis, and Peculiar Magnetic and Electrochemical Properties of Vertically Aligned Arrays of High-Density Co_3O_4 Nanotubes

Hexadecylarsonic acid self-assembled monolayers are prepared on glass, silicon oxide, and titanium oxide via a straight-forward soaking method. These monolayers protect the substrates from micronewton mechanical forces applied in scanning probe microscopy nanoscratching experiments. Compared to hexadecylphosphonic acid, the arsonate shows increased reactivity and greater protection of the substrate from mechanical stress. This system shows excellent potential as a microelectro-mechanical systems (MEMS) lubricant.



Self-Assembly

N. A. LaFranzo, J. A. Maurer*2415–2421

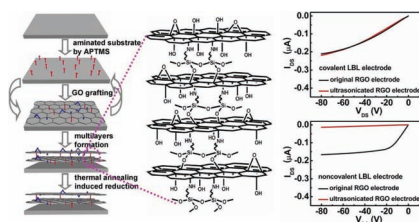
Arsonic Acid Self-Assembled Monolayers Protect Oxide Surfaces from Micronewton Nanomechanical Forces

FULL PAPERS

Field-Effect Transistors

X. Ou, L. Jiang, P. Chen,* M. Zhu,
W. Hu,* M. Liu,* J. Zhu,
H. Ju.....2422–2435

**Highly Stable Graphene-Based
Multilayer Films Immobilized via
Covalent Bonds and Their Applications
in Organic Field-Effect Transistors**

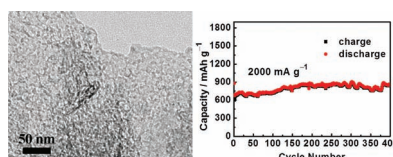


**Highly stable graphene-based multi-
layers films** are covalently immobilized on solid supports. Compared with those formulated through a noncovalent-based method, the as-constructed covalent-based multilayered films display much higher stability and reproducibility, suggesting a bright future for practical applications that require withstanding of multistep post-production processes. The application of the covalent graphene-based films as source/drain electrodes in organic field-effect transistors is investigated.

Batteries

Y. M. Sun, X. L. Hu,* W. Luo, F. F. Xia,
Y. H. Huang*.....2436–2444

**Reconstruction of Conformal
Nanoscale MnO on Graphene as a
High-Capacity and Long-Life Anode
Material for Lithium Ion Batteries**

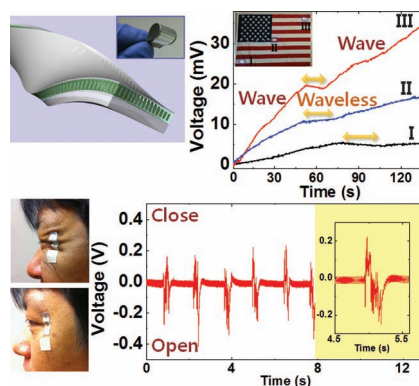


A facile strategy is explored to prepare a hybrid material consisting of MnO nanocrystals grown on conductive graphene nanosheets. A long-term stable nanoarchitecture of graphene-supported ultrafine manganese oxide nanoparticles is formed upon cycling, which yields a high-capacity and long-life anode material for lithium ion batteries.

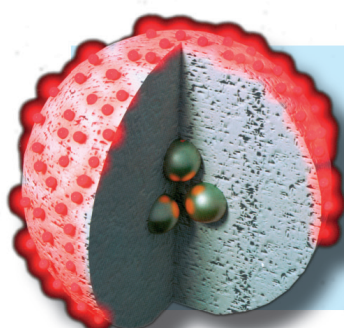
Piezoelectric Materials

S. Lee, S.-H. Bae, L. Lin, Y. Yang,
C. Park, S.-W. Kim, S. N. Cha, H. Kim,
Y. J. Park, Z. L. Wang*.....2445–2449

**Super-Flexible Nanogenerator for
Energy Harvesting from Gentle Wind
and as an Active Deformation Sensor**



**A super-flexible and conformable piezo-
electric nanogenerator (NG)** based on cost-effective Al foil is invented. The super-flexible NG can generate output power in light air and serve as an energy harvesting device under the waving motion of an attached flag due to its excellent conformability. The NGs show potential applications as active sensors that are capable of detecting slight skin movement due to their extremely low resistance to motion. This is a highly promising platform to produce energy harvesting devices and self-powered sensors.



How to contact us:

Editorial Office:

Phone: (+49) 6201-606-286/531
Fax: (+49) 6201-606-500
Email: afm@wiley-vch.de

Reprints:

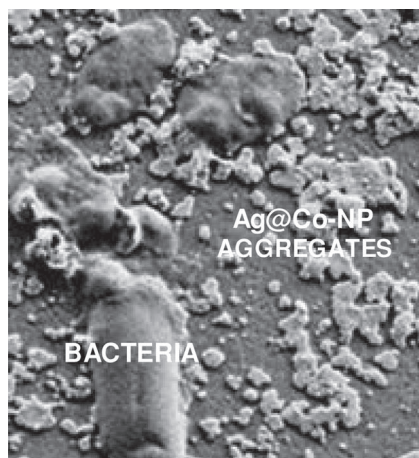
cherth@wiley-vch.de

Copyright Permission:

Fax: (+49) 6201-606-332
Email: rights@wiley-vch.de

FULL PAPER

Ag@Co-nanocomposites with a low cost magnetic Co core and an antibacterial Ag shell, which preserves the core integrity, are fabricated on granulated cation exchange polymeric matrices by intermatrix synthesis under soft reaction conditions. These materials present as superparamagnetic and have enhanced antibacterial activity, making them ideal for water purification applications.



Nanocomposites

A. Alonso, X. Muñoz-Berbel, N. Vigués, R. Rodríguez-Rodríguez, J. Macanás, M. Muñoz, J. Mas, D. N. Muraviev*2450–2458

Superparamagnetic Ag@Co-Nanocomposites on Granulated Cation Exchange Polymeric Matrices with Enhanced Antibacterial Activity for the Environmentally Safe Purification of Water