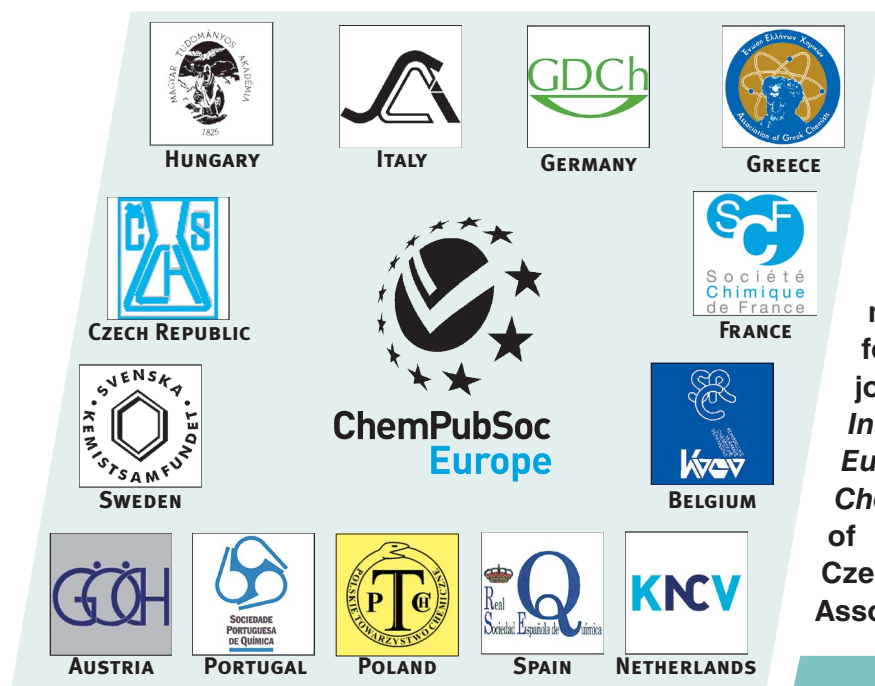


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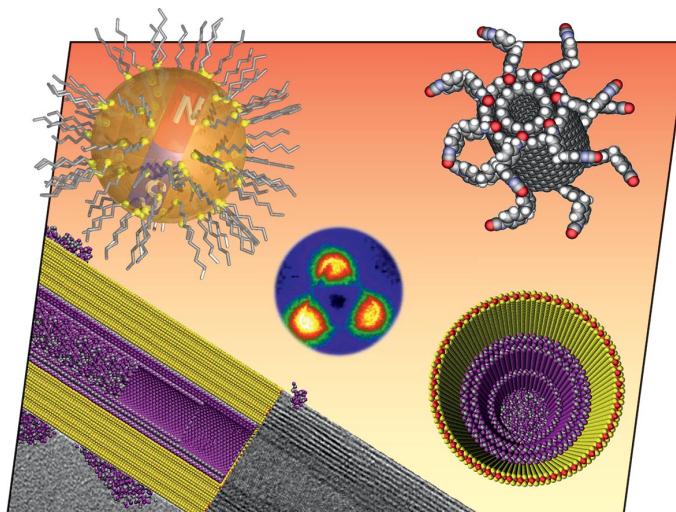


EurJIC is co-owned by 11 societies of ChemPubSoc Europe, a union of European chemical societies for the purpose of publishing high-quality science. All owners merged their national journals to form two leading chemistry journals, the *European Journal of Inorganic Chemistry* and the *European Journal of Organic Chemistry*. Three further members of ChemPubSoc Europe (Austria, Czech Republic and Sweden) are Associates of the two journals.

Other ChemPubSoc Europe journals are *Chemistry – A European Journal*, *ChemBioChem*, *ChemPhysChem*, *ChemMedChem*, *ChemSusChem* and *ChemCatChem*.

COVER PICTURE

The cover picture shows a selection of cutting-edge areas of research on one- and two-dimensional inorganic nanomaterials. I. Pastoriza-Santos et al. (p. 4288ff) discuss high-yield methods of synthesis of both Au and Ag nanoplates and their optical properties, as represented by the EELS intensity distribution map of one silver triangle (middle), related to applications in surface-enhanced Raman scattering (SERS). The magnetic Pd and Pt nanoparticles covered with alkanethiol groups (top left) are the topic of the Micro-review by A. Miyazaki, T. Enoki, et al. (p. 4279ff), who also report on charge transfer at the metal–organic interface. In their Micro-review R. Tenne et al. (p. 4233ff) demonstrate how the encapsulation of one-dimensional crystals in inorganic nanotubes lead to filled inorganic nanotube composites (two views of which are in the bottom left and right corners of the cover picture). The double-walled carbon nanotubes (top right) with optical and chemical activity, which can be applied in preparing multifunctional hybrid materials, are covered in the Short Communication by Y. A. Kim et al. (p. 4305ff). Thanks are due to all these research groups for contributing their designs to make up this composite cover picture.



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MICROREVIEWS

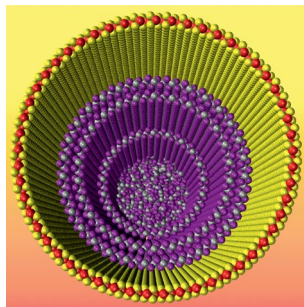
Nanotube Hosts

S. Y. Hong, R. Kreizman, R. Rosentsveig,
A. Zak, J. Sloan, A. N. Enyashin,
G. Seifert, M. L. H. Green,
R. Tenne* 4233–4243



One- and Two-Dimensional Inorganic Crystals inside Inorganic Nanotubes

Keywords: Nanotubes / Adsorption / Nanocapillarity / Carbon / Inorganic salts / Transmission electron microscopy



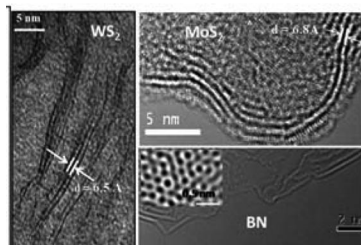
Filled nanotubes can be synthesized with molten inorganic salts by means of nanocapillarity. Structural examinations, filling conditions and molecular dynamic simulations were discussed.

Graphene Analogues

C. N. R. Rao,* A. Nag 4244–4250

Inorganic Analogues of Graphene

Keywords: Graphene / Nanostructures / Molybdenum / Tungsten / Sulfides / Boron / Nitrides



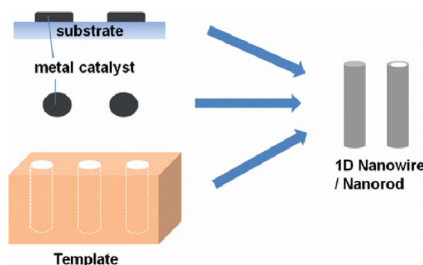
Graphene analogues of WS₂, MoS₂, BN and BCN have been prepared by using bottom-up chemical methods, which constitute a new family of two-dimensional nanostructures. These materials possess a single, two or a few layers. Few-layer BCN and BN show interesting gas adsorption properties.

Nanowires in Photovoltaics

J. Chun, J. Lee* 4251–4263

Various Synthetic Methods for One-Dimensional Semiconductor Nanowires/Nanorods and Their Applications in Photovoltaic Devices

Keywords: Semiconductors / Template synthesis / Synthetic methods / Nanostructures / Colloids



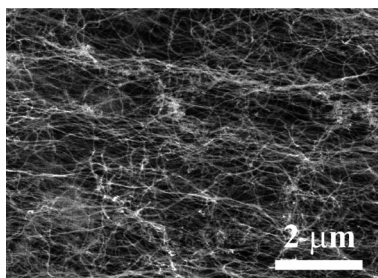
This review covers the recent progress on various synthetic methods, such as the colloidal, vapor–liquid–solid (VLS), solution–liquid–solid (SLS), and template-based methods, for semiconductor 1D nanowires and their applications in photovoltaic devices.

Silicon Nanowires

M. W. Shao,* D. D. D. Ma,
S. T. Lee* 4264–4278

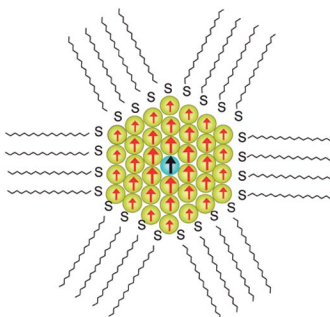
Silicon Nanowires – Synthesis, Properties, and Applications

Keywords: Silicon / Nanostructures / Heterogeneous catalysis / Imaging agents / Sensors



This review summarizes the synthesis, properties, and applications of silicon nanowires for catalysis, Li ion batteries, solar cells, biomedical applications, and sensors.

Novel classes of magnetic nanosystems are created using Pd or Pt nanoparticles covered with alkanethiols and their alloys with a 3d transition metal. Charge transfer at the metal-organic interface and the quantum size effect yield magnetic Pt or Pd nanoparticles. Pd nanoparticles embedded with only one Co atom behave as a single-particle magnet showing blocking behaviour.



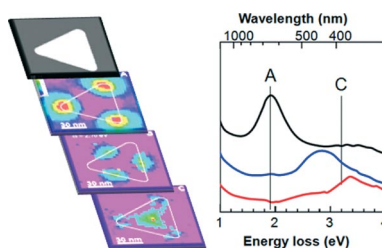
**A. Miyazaki,* Y. Ito,
T. Enoki* 4279–4287**

Classes of Nanomagnets Created from Alkanethiol-Coated Pt or Pd Nanoparticles and Their Alloys with Co

Keywords: Metal nanoparticles / Quantum-size effect / Metal-organic interface / Exchange enhancement / Single particle magnet

Plasmonic Nanoplates

Noble metal nanoplates display extremely interesting optical properties based on their characteristic plasmonic response. Thanks to the huge development of synthetic methods, both dimensions and surface plasmon resonances can be tuned in the visible and NIR, with many potential applications.



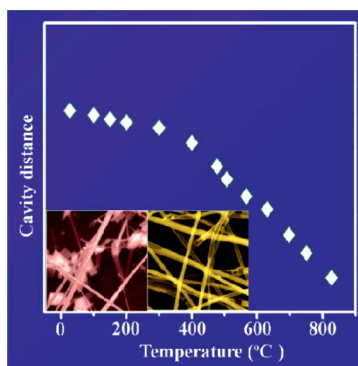
**I. Pastoriza-Santos,* R. A. Alvarez-Puebla,
L. M. Liz-Marzán 4288–4297**

Synthetic Routes and Plasmonic Properties of Noble Metal Nanoplates

Keywords: Nanoplates / Gold / Silver / Plasmons / Synthesis design / SERS

Nanothermometers

Core-shell nanostructures have been fabricated and used as nanothermometers for in situ TEM. The figure shows core-shell nanostructures and their thermal expansion behavior from the solid state to the liquid state. Growth mechanisms and characterization of the nanocables, as well as the thermal stability of oxide compounds, are discussed.



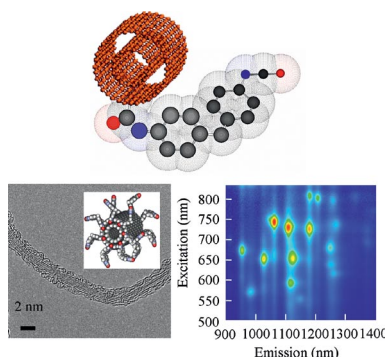
C.-Y. Wang, L.-J. Chen* 4298–4303

Nanothermometers for Transmission Electron Microscopy – Fabrication and Characterization

Keywords: Core-shell nanoparticles / Nanostructures / Nanothermometers / Transmission electron microscopy / Gallium / Gold

SHORT COMMUNICATIONS

Chemically reactive aromatic diisocyanate was covalently introduced into the side-walls of single- and double-walled carbon nanotubes (SWNTs and DWNTs). The strong and stable optical signals originate from the geometrically shielded inner tubes of the DWNTs. The optically and chemically active DWNTs will find their use in preparing multifunctional hybrid materials.



**Y. C. Jung, H. Muramatsu, T. Hayashi,
J. H. Kim, Y. A. Kim,* M. Endo,
M. S. Dresselhaus 4305–4308**

Covalent Attachment of Aromatic Diisocyanate to the Sidewalls of Single- and Double-Walled Carbon Nanotubes

Keywords: Nanotubes / Carbon / Isocyanates / Covalent bonds / IR spectroscopy

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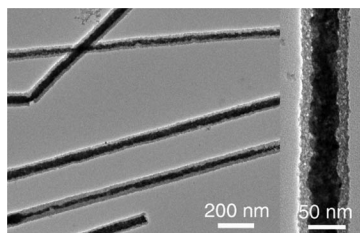
AuNi/NiO Nanocables

Q. Xu,* G. Meng,* B. Chen, X. Li,
X. Zhu, Z. Chu, M. Kong 4309–4313



Synthesis of AuNi/NiO Nanocables by Porous AAO Template Assisted Galvanic Deposition and Subsequent Oxidation

Keywords: Nanocables / Nanostructures / Redox chemistry / Template synthesis



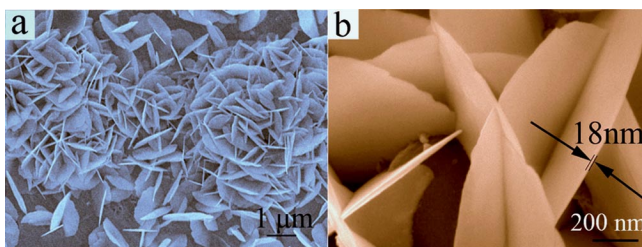
AuNi/NiO coaxial nanocables have been prepared by infiltrating a gold-coated anodic aluminum oxide template, with ring-shaped Al foil on its outer edge, with a mixed aqueous solution of NiCl_2 and HAuCl_4 to form AuNi/Ni nanocables, and subsequent immersion in an aqueous NaOH solution to oxidize the Ni sheath during template removal.

Carbon Nanoplates

T. Mei, T. Li, H. Bi, L. Wang, Y. Zhu,*
Y. Qian* 4314–4320

Synthesis and Electrical Capacitance of Carbon Nanoplates

Keywords: Carbon / Nanoplates / Aggregation / Nanostructures / Capacitance properties



Several kinds of carbon nanoplates were successfully prepared. Aggregates of these carbon nanoplates exhibit capacitances of

up to 184 F g^{-1} , which makes them potential candidates to be used as electrode material for supercapacitors.

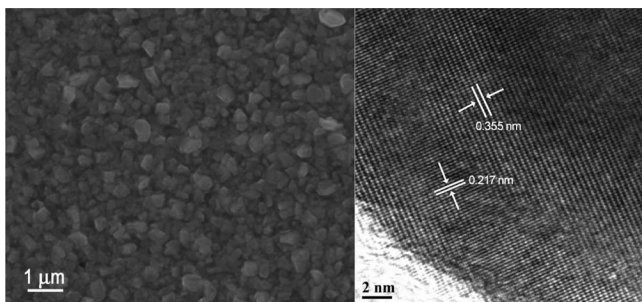
Thermoelectric PbSe Thin Films

Z. L. Sun, S. C. Liufu,* X. H. Chen,
L. D. Chen 4321–4324



Solution Route to PbSe Films with Enhanced Thermoelectric Transport Properties

Keywords: Thermoelectrics / Thin films / Solution synthesis / Lead / Selenium



PbSe thin films, constructed by compacted nanoparticles in the range 100–400 nm, were synthesized by a facile solution route through rational design of the precursor solution. The films exhibit a

maximum thermoelectric power factor ($31.5 \mu\text{W cm}^{-1} \text{ K}^{-1}$) at 440 K, which is larger than that of the bulk PbSe by 57%, making the present PbSe films promising thermoelectric (TE) films.

FULL PAPERS

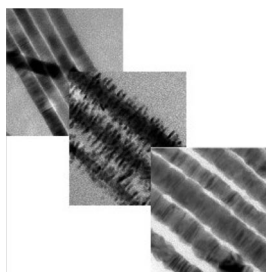
Semiconductor Nanowires

Z. Li*, X. D. Ma, Q. Sun, Z. Wang,
J. Liu, Z. H. Zhu, S. Z. Qiao, S. C. Smith,
G. Q. Lu,* A. Mews* 4325–4331



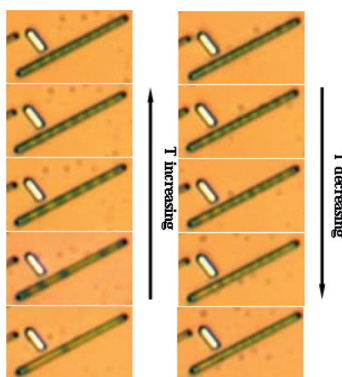
Synthesis and Characterization of Colloidal Core–Shell Semiconductor Nanowires

Keywords: Nanotechnology / Nanostructures / Semiconductors / Cadmium / Core–shell structures



Colloidal CdSe nanowires have been successfully coated with CdS by using a single-source precursor. Initially formed CdS nanorods on the CdSe nanowire surface transform into a complete shell through surface-ripening processes.

This paper contains the structural characterization of VO₂ nanowires grown on sapphire substrates by electron microscopy. The resistance in metal-to-insulator transition (MIT) was measured. As polydomain structure was observed in MIT, and there was interesting hysteresis behavior, a theoretical analysis was performed.



Y. Cheng, T. Zhang, Y. Cai, K. M. Ho,
K. K. Fung, N. Wang* 4332–4338

Structure and Metal-to-Insulator Transition of VO₂ Nanowires Grown on Sapphire Substrates

Keywords: Metal-to-insulator transitions / Nanowires / Phase transitions / Chemical vapor deposition / Vanadium

Heteroepitaxial ZnO Nanorods

Heteroepitaxial growth of well-aligned ZnO nanorods with high crystalline and optical qualities on GaAs (111) substrates was achieved through electrochemical deposition at low temperature without any buffer layer for the first time.

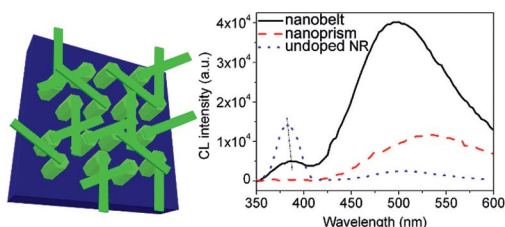


H. B. Zeng,* Y. Bando, X. J. Xu,*
L. Li, T. Y. Zhai, X. S. Fang,
D. Golberg 4339–4343

Heteroepitaxial Growth of ZnO Nanorod Arrays on GaAs (111) Substrates by Electrochemical Deposition

Keywords: Zinc / Nanostructures / Electrochemical deposition / Epitaxial growth / Crystal growth

Hierarchical Nanoarrays



Highly oriented and well-aligned hierarchical nanostructures composed of vertically grown In₂O₃(ZnO)_m (*m* = 2, 3, 4, and 5) nanoprisms and horizontally grown ZnO:In nanobelts can be spontaneously

formed through a conventional vapor-phase transport and condensation method while co-evaporating the well-mixed ZnO, graphite, and In powders.

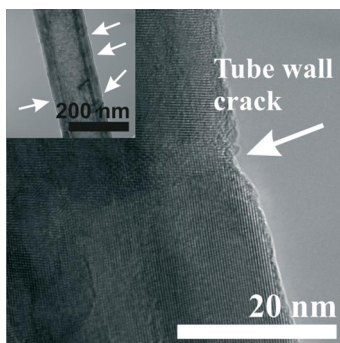
N. Pan, H. Z. Xue, J. H. Huang,
G. H. Zhang, Y. K. Wu, M. Li,
X. P. Wang,* J. G. Hou 4344–4350

Self-Assembly and the Properties of a Highly Oriented Hierarchical Nanobelt–Nanoprism Array of Ternary Oxide Zn–In–O

Keywords: Nanostructures / Doping / Superlattices / Zinc / Indium

Nanotube Cracks

Annealing of anodic TiO₂ nanotubes to anatase can lead (depending on the conditions) to significant structural damage (cracks in the tube wall) and other undesired effects that can critically affect applications.



S. P. Albu, H. Tsuchiya, S. Fujimoto,
P. Schmuki* 4351–4356

TiO₂ Nanotubes – Annealing Effects on Detailed Morphology and Structure

Keywords: Titanium / Nanotubes / Crystallization / Anodization / DSSC / Electrochemistry

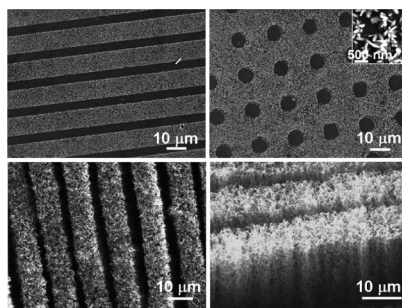
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Microcontact Printing

L. Ding, C. Q. Li, W. Zhou, H. B. Chu,
X. Sun, Z. Cao, Z. H. Yang, C. Yan,
Y. Li* 4357–4362

Patterning Nanoparticles by Microcontact
Printing and Further Growth of One-
Dimensional Nanomaterials

Keywords: Microcontact printing / Nano-
particles / ZnO / Carbon nanotubes /
Nanomaterial arrays



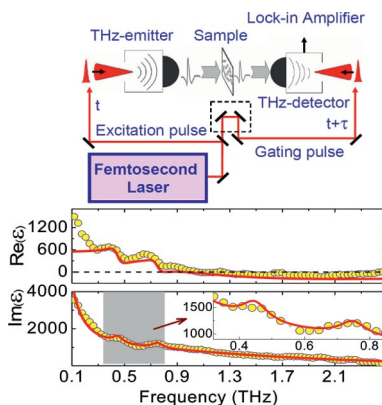
Micrometer-scale patterns of various functional nanoparticles were fabricated by using a hydrophobic poly(dimethylsiloxane) (PDMS) stamp with microcontact printing. The produced nanoparticles can be used as seeds or catalysts for the growth of 1D nanomaterials such as ZnO nanorods and carbon nanotubes. This may be used as a general technique to pattern 0D and 1D nanomaterials on substrates.

THz Time Domain Spectroscopy

S. Kumar, N. Kamaraju, A. Moravsky,
R. O. Loutfy, M. Tondusson, E. Freysz,
A. K. Sood* 4363–4366

Terahertz Time Domain Spectroscopy to
Detect Low-Frequency Vibrations of
Double-Walled Carbon Nanotubes

Keywords: Carbon / Nanotubes / Time-
resolved spectroscopy / Dielectric func-
tion / Low-frequency phonons



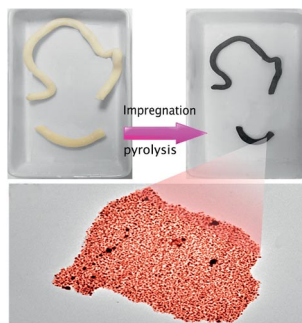
We experimentally observed two low-frequency phonon modes at 0.45 and 0.75 THz for a free-standing double-walled carbon nanotube film of thickness 200 nm by using terahertz time domain spectroscopy. The complex dielectric function was measured in the range 0.1–2.5 THz. The film cuts the amplitude of the THz pulse by almost 50% without affecting its temporal width, suggesting a possible application as neutral density filter in the THz spectral range.

Carbon–Metal Nanocomposites

F. Li, L. Li, X. Liao, L. Tong, Z. Chen,
Y. Wang* 4367–4373

Synthesis of Two-Dimensional Carbon and
Carbon–Metal Nanocomposites Using a
Natural Cellular Material as the Carbon
Precursor

Keywords: Organic-inorganic hybrid com-
posites / Carbon / Cellulose / Nanoflakes /
Nanoparticles / Nanocomposites / Pyr-
olysis



Two-dimensional, flake-shaped carbon and carbon–metal nanocomposites with nanometer-sized thickness and a large lateral size up to hundreds of micrometers were easily synthesized using a naturally existing cellular material, the stem pith of the rice-paper plant, both as the carbon precursor and also the synthesis template.

* Author to whom correspondence should be addressed.

Supporting information on the WWW (see article for access details).

If not otherwise indicated in the article, papers in issue 26 were published online on September 8, 2010