

Materials for Information Technology

In a new *Advanced Engineering Materials* special issue on *Materials for Information Technology* an overview of the state-of-the-art in the research and development of materials for IT, with a particular emphasis on future scenarios is provided. The latest results in materials science and engineering, together with applications in industry, are covered, with a clear focus on thin-film and nano-scale materials. The papers include content ranging from materials-related aspects of thin-film processes - such as atomic layer deposition (ALD) and spin-coating - to advanced materials for future electronic and photonic devices and microelectromechanical systems (MEMS), as well as materials for assembly and packaging. Computer modeling and analytical techniques for the characterization of thin-film structures are also described. Specific materials discussed include metal oxides with high dielectric permittivities, carbon-based nanomaterials, nanostructured metals and alloys, semiconductors and organic thin films. As the guest editor Ehrenfried Zschech (AMD, Dresden) points out, many of the studies presented demonstrate the positive impact of funding provided by the German funding organizations BMBF and DFG, and reflect the existing widespread interest in materials for IT and provide insights into, in particular, the direction of new developments in synthesis of and special applications for these fascinating and useful materials. /jr

Adv. Eng. Mater. **2009**, *11*, Issue 4

Colloidal Hollow Spheres

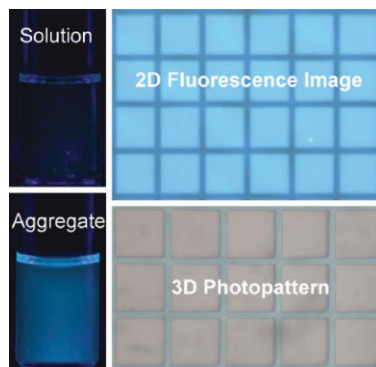
Colloidal hollow spheres of conducting polymers such as polypyrrole (PPy) or polyaniline (PAni) are produced with a template-directed and surface-modified method using pretreated polystyrene beads. The resulting core/shell colloidal spheres display smooth surfaces and uniform controllable sizes. The application of such

biocompatible hollow spheres as contrast agents for sonography is also demonstrated (see image). /sos

Y. Xia et al., *Small*, DOI: 10.1002/smll.200900447

Multifaceted Photonic Functionalities by Metal-Free Click Chemistry

The Cu(I)-mediated "click reaction" is a powerful tool that has found a variety of applications in diverse areas of research, including protein conjugation and surface modification. However, in polymer synthesis, the metallic catalysts used often lead to poor solubility and to deteriorated photophysical properties. The group around Ben Zhong Tang from the Hong Kong University of Science and



Technology reports on the synthesis of tetraphenylethene-containing poly-(aroyltriazole)s (PATA)s by metal-free thermal click polymerization. High yields and regioregularities demonstrate the great versatility of this click variant. The resultant PATAs exhibit not only the aggregation-induced emission feature but also other useful photonic properties, such as high optical transparency, tunable refractive indexes, and sensitive response to photoirradiation, making them promising candidates in different high-tech applications. /ks

B. Z. Tang et al., *Adv. Funct. Mater.*, DOI: 10.1002/adfm.200801933

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J. F. Mano
Adv. Eng. Mater. **2008**, *10*, 515

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R. Mülhaupt et al.
Macromol. Rapid Commun. **2009**, *30*, 316

Polymer Photovoltaic Cells Based on Solution-Processable Graphene and P3HT

Y. S. Chen et al.
Adv. Funct. Mater. **2009**, *19*, 894

Polymerization of Oligo(ethylene glycol) (Meth)acrylates: Toward New Generations of Smart Biocompatible Materials

J. F. Lutz
J. Polym. Sci., Part A: Polym. Chem. **2008**, *46*, 3459

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X. Q. Jia et al.
Macromol. Biosci. **2009**, *9*, 140

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Y. D. Li et al.
Small **2009**, *5*, 681

Main Properties and Current Applications of Some Polysaccharides as Biomaterials

M. Rinaudo
Polym. Int. **2008**, *57*, 397

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A. Fontcuberta i Morral et al.
phys. status solidi a **2009**, *206*, 173

Polymer-Fullerene Bulk-Heterojunction Solar Cells

C. J. Brabec et al.
Adv. Mater. **2009**, *21*, 1323

Preparation of a Superhydrophobic Rough Surface

S. Michielsen et al.
J. Polym. Sci., Part B: Polym. Phys. **2007**, *45*, 253

Recent Advances in Reactive Extrusion Processing of Biodegradable Polymer-Based Compositions

P. Dubois et al.
Macromol. Mater. Eng. **2008**, *293*, 447