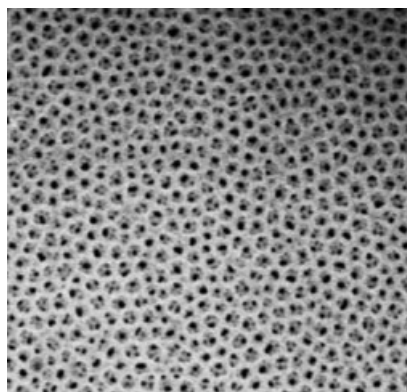


## Zirconium Nanotubes Self-Arrange Well Ordered

Highly ordered arrays of anodic nanopores or nanotubes have attracted tremendous scientific interest within the last few years. Numerous potential applications for nanotubular zirconium exist such as for catalyst support structures, for sensing or as a solid state electrolyte. However, many of these functions require a further optimization of the growth morphology. Surface pretreatments of the metallic



Zr substrate drastically improve self-ordering of anodic  $ZrO_2$  nanotube arrays. A two-step anodization process is used to grow highly regular structures. Using organic electrolytes, significantly thicker continuous nanotubular layers can be grown than in aqueous electrolyte systems. /sh

S. Berger et al., *phys. status solidi RRL* **2008**, 2, 102

## With Filled Polymers against Termites?

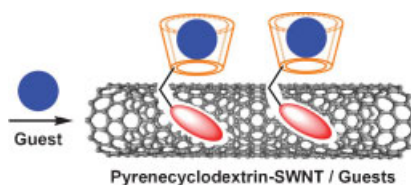
The damage of wood by termites has enormous commercial significance worldwide in terms of time, human resources and financial cost. Traditional pesticides (organochlorides, pyrethroids) pose a biohazard, while physical methods (stainless steel, mortar, glue traps) to prevent damage are impracticable on a large scale. An innovative approach to barrier design is developed and tested here, namely a polyurethane-based elastomeric barrier. Polyurethane blends containing

0, 0.5, and 5% of layered silicates were prepared and monitored for the release of Bifenthrin (the active pesticide). The results of this study indicate the persistence of Bifenthrin within the polymer unless subjected to strong chemical effusion, which is unlikely in the field. The presence of silicates had no significant effect on the diffusion. The data fitting suggests that Fickian diffusion forms an adequate description for leaching of the active from the polymer matrix. This opens the way in the future to choose a matrix to conform to desired leaching characteristics. /ks

R. G. Gilbert, *J. Appl. Polym. Sci.*, DOI: 10.1002/app.28044

## Sense and Sensitivity

A device to sense particular organic molecules, based on the concept of molecular recognition, has been developed by Fraser Stoddart, George Grüner, and their team at the University of California (US). The new device consists of a field-effect transistor (FET) fabricated with single-walled carbon nanotubes (SWNTs) and modified with a pyrenecyclodextrin derivative. In the presence of certain molecules the transistor characteristics of the pyrenecyclodextrin-decorated SWNT-



FET device shift towards negative gate voltage. The results indicate that the electrical conductance of the device is highly sensitive to certain organic molecules and varies significantly with changes in the surface adsorption of these molecules. "The SWNT-FET device serves as a chemical sensor to detect organic molecules, not only selectively but also quantitatively," say the researchers, writing in *Advanced Materials*. This technology may lead to new applications in areas such as environmental monitoring, medical diagnostics, and gene-chip technologies. /sl

J. F. Stoddart et al., *Adv. Mater.*, DOI: 10.1002/adma.200702804

## In Brief

### Advancing Silicon Technology by Metal-Oxide Integration

Controlled growth of crystalline  $Gd_2O_3$  on Si without interfacial layers makes lanthanide oxides highly promising candidates for high- $K$  dielectrics and nanostructures in future MOS devices. /sb

H. J. Osten et al., *phys. status solidi a*, DOI: 10.1002/pssa.200723509

### Cationic Conjugated Polymers

A reduction in the charge density of cationic conjugated polymers synthesized via Suzuki coupling polymerization results in a significant enhancement in the signal output of dye-labeled single-stranded DNA (ssDNA). /ct

K.-Y. Pu et al., *Adv. Funct. Mater.*, DOI: 10.1002/adfm.2007001018

### High-Temperature Multi-component Polymerizations – An Extended Model

Complex formulations based on acrylic resins are used to produce commercial coatings by semi-batch starved-feed solution copolymerization. An extended model allows to describe key parameters and influences on the molecular weight development. /ssp

R. A. Hutchinson et al., *Macromol. React. Eng.*, DOI: 10.1002/mren.200700051

### ZnO Micro- and Nanocrystals with Size and Location Control

The reported nucleation and growth process provides a new route towards the production of ZnO micro- and nanostructures at known locations (ca. 100nm STD) with well-defined dimensions (4% STD). /ct

H. O. Jacobs et al., *Adv. Mater.*, DOI: 10.1002/adma.2007003102

### New Glucose-Responsive Hydrogel Based on PNiPAM

A new highly attractive type of glucose-responsive hydrogel with rapid response to blood glucose concentration change at physiological temperature has been successfully developed. /ct

L. Y. Chu, *Polym. Adv. Technol.*, DOI: 10.1002/pat.1079

### An Easy Way towards Well-Defined DendriMacs

A highly simplified, less time consuming method involving fewer reaction steps leads to well-defined branched polybutadiene macromolecules in high yields. /ks

S. M. Kimani et al., *Macromol. Rapid Commun.*, DOI: 10.1002/marc.200700851