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ADVANCED FUNCTIONAL MATERIALS



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Entangled Carbon Nanotube Networks in Polycarbonate

Thermosensitive Core-Shell Microspheres

Ga_{1-x}N Used for Biosensors

Hexagonally Ordered Arrays of Metallic Nanodots

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Cover: Sundararajan and co-workers have discovered a method for dispersing ropes or bundles of single-walled carbon nanotubes in a polycarbonate matrix, which is reported in full on p.868. The cover shows a scanning electron microscopy image of an entangled carbon nanotube network at the fractured surface of a composite of 0.06 wt.-% nanotubes in polymer.

ADVANCED FUNCTIONAL MATERIALS

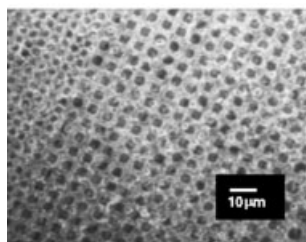
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Full Papers

Micro- and nanometer-scale patterned TiO₂ electrode (see Figure) and layer-by-layer polyelectrolyte multilayer/oligoethylene glycol dicarboxylic acid (OEGDA) composite films were applied to dye-sensitized photovoltaic devices. Significant improvement of the photovoltaic performance was achieved by both the use of OEGDA and the patterning of the TiO₂ electrode.

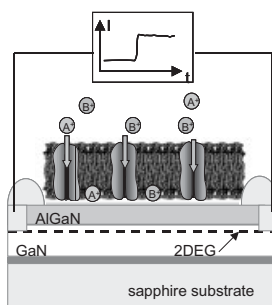


H. Tokuhisa, P. T. Hammond*

Adv. Funct. Mater. **2003**, *13*, **831** ... 839

Solid-State Photovoltaic Thin Films using TiO₂, Organic Dyes, and Layer-by-Layer Polyelectrolyte Nanocomposites

The applicability of group III nitrides for the fabrication of biosensors is demonstrated (the Figure shows a schematic of a biosensor based on an transparent heterostructure field-effect transistor (FET) as the readout device for selective ion transport across a lipid membrane). Ion-sensitive AlGa_xN/GaN heterostructure FETs show high pH sensitivity and low drift. The device surfaces are chemically robust and non-toxic to living cells.

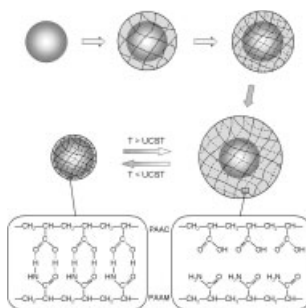


G. Steinhoff, O. Purrrucker, M. Tanaka, M. Stutzmann, M. Eickhoff*

Adv. Funct. Mater. **2003**, *13*, **841** ... 846

Al_xGa_{1-x}N—A New Material System for Biosensors

A novel family of highly monodisperse, thermo-sensitive core-shell hydrogel microspheres is reported. They show positively thermo-responsive volume phase transition characteristics, i.e., the particle swelling is induced by an increase rather than a decrease in temperature, with tunable swelling kinetics. A schematic of the proposed swelling mechanism and the preparation procedure is shown in the Figure.



X.-C. Xiao, L.-Y. Chu,* W.-M. Chen, S. Wang, Y. Li

Adv. Funct. Mater. **2003**, *13*, **847** ... 852

Positively Thermo-Sensitive Monodisperse Core-Shell Microspheres