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materialstoday
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Regulars

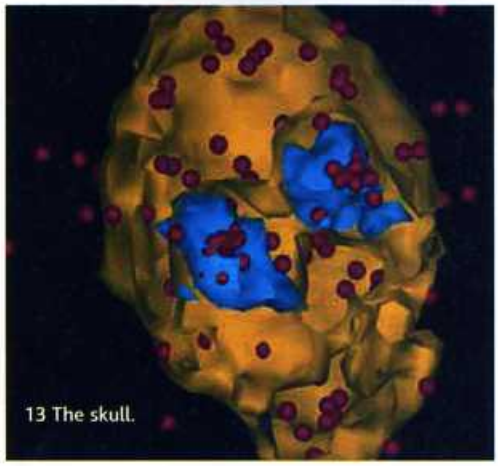
Updates

Cover Image

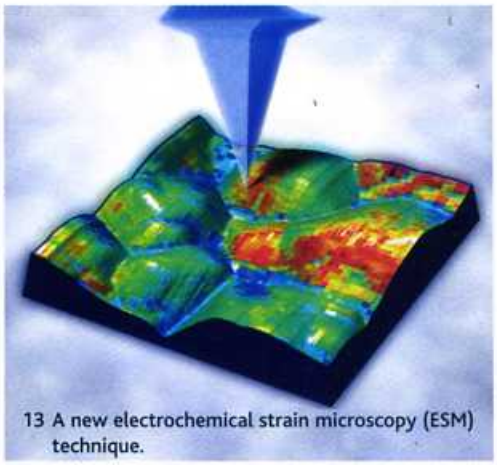
A scanning electron micrograph of a graphitic scaffold derived from beech wood. Wood-derived scaffolds are produced via a pyrolysis process, which employs a nickel-based catalyst to promote graphite formation. By using a liquid catalyst system, the three-dimensional wood detail is preserved in the final graphitic product. Both large and small cellular features, originating from the tree's support and nourishment infrastructure, are visible in the micrograph. The wide variety of wood species available allows for microstructural selection in the final graphitic scaffold.

M.T. Johnson and K.T. Faber, supported by the U.S. National Science Foundation, Grant No. DMR-0710630

12 Nanocellulose.



13 The skull.



13 A new electrochemical strain microscopy (ESM) technique.

Lead story 14

Volume morphology of printable solar cells

Printable polymer or hybrid solar cells (PSCs) have the potential to become one of the leading technologies of the 21st century in conversion of sunlight to electrical energy. Because of their ease of processing from solution fast and low cost mass production of devices is possible in a roll-to-roll printing fashion.

Joachim Loos

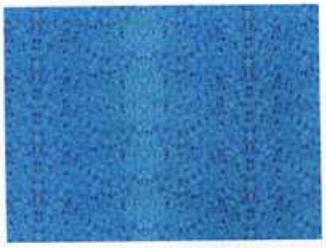
Organoelectronic technologies

Review 22

Carbon nanotube-guided thermopower waves

Choi et al., review nanomaterials designed to overcome limitations of thermoelectricity and explore the emerging scientific and practical outlook for devices using thermopower waves

Wonjoon Choi, Joel T. Abrahamson, Jennifer M. Strano, and Michael S. Strano

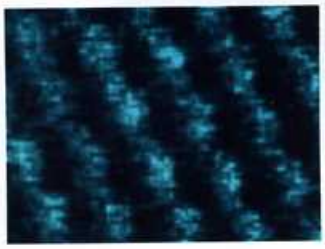


Current Research 34

Probing the improbable: imaging C atoms in alumina

Marquis et al., demonstrate that bulk alumina can be quantitatively analyzed and microstructural features observed.

Emmanuelle A. Marquis, Noor A. Yahya, David J. Larson, Michael K. Miller, Richard I. Todd



Current Research 38

Sensing current and forces with SPM

In this review, Park et al., show hybrid combinations of AFM and STM that bring together the best of two worlds: the simultaneous detection of atomic scale forces and conduction properties.

Jeong Y. Park, Sabine Maier, Bas Hendriksen, and Miquel Salmeron

Next issue

Materials Today **looks at some interesting technologies and applications from across the discipline....**

Technology and swimming

The authors focus on the impact of materials science in swimming by measuring the impact of the three successive generations of swimsuits on human performance.

Electrospinning to Forcespinning TM

A new process called ForcespinningTM has been developed to make nanofibers from a wide range of materials

Cryogels: Freezing unveiled by thawing

Cryogels are interconnected supermacroporous gels prepared at sub-zero temperatures having applications in various research fields.

Reassessing the melting temperature of PuO_2

The melting behavior is a fundamental property of a material. This point becomes critical in nuclear engineering where the thermo-mechanical stability of a nuclear fuel element is a key factor determining fuel performance and safety

Electrospun nanomaterials for ultrasensitive sensors

Electrospinning exhibits the unique ability to produce diverse forms of fibrous assemblies.