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2012/06/26

Melanie Kah and Thilo Hofmann from the Department of Environmental Geosciences of the University of Vienna recently performed an extensive analysis of this emerging field of research. "A good understanding of nano-materials is essential to evaluate whether the benefits overcome potential new risks", explains Thilo Hofmann, dean elected at the Faculty of Geosciences, Geography and Astronomy of the University of Vienna. Since those nano-pesticides have new or enhanced properties, this will ...

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Nano-oils keep their cool Rice University lab uses nanoparticles to increase thermal properties of transformer oil Rice University scientists have created a nano-infused oil that could greatly enhance the ability of devices as large as electrical transformers and as small as microelectronic components to shed excess heat. The Rice team headed by lead authors Jaime Taha-Tijerina, a graduate student, and postdoctoral researcher Tharangattu Narayanan focused their efforts on transformers for

the 21st century. The nano-oils have enhanced thermal conductivity and improved dielectric properties. The nano-oils also have enhanced thermal stability and improved dielectric properties.

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Author: Richard Jones

Published: August 2004

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[Taming light at the nanoscale](#)

Author: Nader Engheta

Published: September 2010

Article type: Features

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[DNA as an engineering material](#)

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Microfabricated single-cell capture and DNA stretching devices have been produced by injection molding. The fabrication scheme employed deep reactive ion etching in a silicon substrate, electroplating in nickel and molding in cyclic olefin polymer. This work proposes technical solutions to fabrication challenges associated with chip sealing and demolding of polymer high-volume replication methods. UV-assisted thermal bonding was found to ensure a strong seal of the microstructures in the molded part without altering the geometry of the channels. In the DNA stretching device, a low aspect ratio nanoslit (1/200) connecting two larger micro-channels was used to stretch a 168.5 kbp DNA molecule, while in the other device single-HeLa cells were captured against a micro-aperture connecting two larger microfluidic channels. Different dry etching processes have been investigated for the master origination of the cell-capture device. The combination of a modified Bosch process and an isotropic polysilicon etch was found to ensure the ease of demolding by resulting in slightly positively tapered sidewalls with negligible undercut at the mask interface.

- PACS**
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