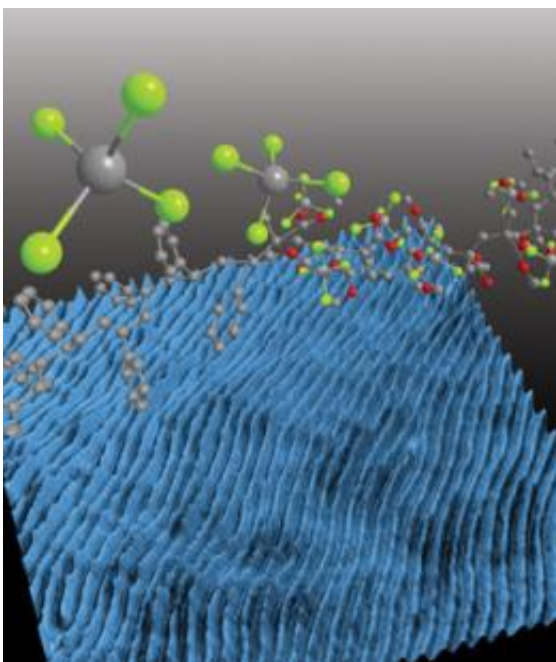


Paper highlight: Nanoscopic patterned materials with tunable dimensions

August 19 2010



Artist's rendition of nanoscopic patterned materials with tunable dimensions via atomic layer deposition on block copolymers.

A collaboration between CNM's Electronic & Magnetic Materials & Devices Group and Argonne's Energy Systems Division has led to an entirely new way to fabricate both two- and three-dimensional functional nanomaterials.

Their approach combines block copolymer self-assembly with the self-

limiting and selective process of atomic layer deposition.

By choosing suitable polymer and deposition precursor chemistries, highly selective deposition can be achieved in which the inorganic material grows within only one of the polymer blocks.

Through rational design of block copolymers and selection of deposition parameters, patterned designer materials with controlled size, spacing, symmetry, and composition can be synthesized.

Potential applications for this method extend to virtually all technologies in which periodic nanomaterial structures are desirable.

More information: Q. Peng, Y.-C. Tseng, S. B. Darling, and J. W. Elam, *Advanced Materials*, in press.

Provided by Argonne National Laboratory

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