



## New Surface-Modifying Film for BCP Formation

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**WARF: P130124US01**

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**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a polymer film that induces vertical domain formation in styrene-containing block copolymers.**

### Overview

Block copolymers (BCPs) self-assemble into well-defined, highly regular and dense nanostructures. Such BCP arrays are useful for fabricating electronic devices like magnetic storage media, quantum dot arrays and nanowire transistors.

For BCP arrays to be consistent and useful, it is critical to control the orientation of BCP microdomains as they take shape on a substrate. Vertical domains (i.e., those oriented perpendicularly to the substrate) are especially advantageous. Special copolymer films, called surface-modifying layers, can be used for this purpose.

### The Invention

UW-Madison researchers have developed new surface-modifying layers made of crosslinked copolymer film. More specifically, the film is composed of styrene, (meth)acrylate and crosslinkable epoxy group-functionalized monomers.

Various styrene-containing BCPs can be deposited on top of the film and then subjected to conditions that cause them to self-assemble into vertically oriented domains.

### Applications

- Magnetic storage media, such as hard disk drives
- Quantum dot arrays
- Photonic crystals
- Photovoltaic cells
- Nanowire transistors
- Other electronic devices, including integrated circuits

### Key Benefits

- Films are robust and stable.
- Can be made from widely available and inexpensive monomers
- Enables wider selection of substrates

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#### For More Information About the Inventors

- [Padma Gopalan](#)

#### Related Technologies

- [WARF reference number P09005US describes a photopatternable layer for controlling block copolymer microdomain orientation.](#)
- [WARF reference number P100296US02 describes a method for direct patterning in block copolymer lithography.](#)

#### Tech Fields

- [Materials & Chemicals : Polymers](#)
- [Semiconductors & Integrated Circuits : Design & fabrication](#)

For current licensing status, please contact Jeanine Burmania at [jeanine@warf.org](mailto:jeanine@warf.org) or 608-960-9846

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