

## **BUILDING ORGANIC MATERIALS FROM THE BOTTOM UP WITH SELF-ASSEMBLING BLOCK COPOLYMERS**

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### **ABSTRACT**

The control over molecular structure that has been enabled by the continued development of new synthetic techniques has translated to continually improving control over the assembly of molecules and macromolecules. We have designed and synthesized several classes of copolymers with stimulus-responsive components and metal-binding sites. These polymers form assemblies with properties that are dependent upon specific conditions. For example, we have investigated a range of synthetic systems that are designed to assemble in water into smaller micellar aggregates at low temperatures and larger vesicles at higher temperatures. A number of factors, including block size and extent of interblock interactions, appear to be important in controlling transformation rate. The design of these and other systems, including metal-functionalized polymers and conjugated polymers, and our efforts to better understand the behavior of the resulting materials will be discussed.