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Highly Ordered Block Copolymer Templates for the Generation of Nanostructured Materials E. BHOJE GOWD, BHANU NANDAN, NADJA C. BIGALL, ALEXANDER EYCHMULLER, MANFRED STAMM, LEIBNIZ INSTITUTE OF POLYMER RESEARCH DRESDEN, HOHE STRASSE 6, 01069 DRESDEN, GERMANY TEAM, PHYSICAL CHEMISTRY, TU DRESDEN BERGSTRASSE 66B, 01062 DRESDEN, GERMANY TEAM — Among many different types of self-assembled materials, block copolymers have attracted immense interest for applications in nanotechnology. Block copolymer thin film can be used as a template for patterning of hard inorganic materials such as metal nanoparticles. In the present work, we demonstrate a new approach to fabricate highly ordered arrays of nanoscopic inorganic dots and wires using switchable block copolymer thin films. Various inorganic nanoparticles from a simple aqueous solution were directly deposited on the surface reconstructed block copolymer templates. The preferential interaction of the nanoparticles with one of the blocks is mainly responsible for the lateral distribution of the nanoparticles in addition to the capillary forces. Subsequent stabilization by UV-irradiation followed by pyrolysis in air at 450 °C removes the polymer to produce highly ordered metallic nanostructures. This method is highly versatile as the procedure used here is simple, eco-friendly and provides a facile approach to fabricate a broad range of nanoscaled architectures with tunable lateral spacing.

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