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Electrochemically Controlled Self-Assembly of an Organometallic Block Copolymer HANY EITOUNI, NITASH BALSARA, U.C. Berkeley, LBNL — We have established a technique for exerting localized reversible control over the formation of block copolymer microphases. The application of electrical fields as low as 2 V/cm across a 17 weight % solution of a disordered, partially oxidized poly(isoprene-*block*-ferrocenyldimethylsilane) copolymer in dichlorobenzene results in the formation of ordered domains near the positive electrode. Spatially- and temporally-resolved small-angle neutron scattering (SANS) and birefringence measurements on the sample in the presence of the electric field were used to follow the order formation process. After reversal of the electrical bias on the system, the ordered regions underwent order-to-disorder transitions and new ordered regions were formed at the opposite electrode. Optical birefringence measurements indicated that the ordered regions possessed significant long-range orientational order.

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