

Magnetoelectric coupling in multiferroic BiFeO₃ nanodot

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Magnetoelectric BiFeO₃ (BFO) has attracted great interest due to its promising application to magnetoelectric devices. To study the coupling effect of nano-sized BFO, we prepared the high density array of BFO nanoislands on a single crystalline substrate by using porous polymer template. The porous template was obtained by plasma etching on a polystyrene film with alumina membrane as an etching mask. The BFO precursor dropped into the porous template, followed by spin-coated. The polymer template was completely removed at high temperature. During this process, the BFO nanoislands were formed epitaxially on the substrate. Crystal structure and the magnetoelectric coupling of BFO nanoislands were studied by X-ray diffraction, and magnetic force microscopy, respectively.