

Abstract Submitted
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Three Dimensional, Single-crystal, Oxide NANOFENCES for Epitaxial Growth of Electronic, Magnetic or Electromagnetic Nanoscale-Devices¹ AMIT GOYAL, SUNG-HUN WEE, KARREN MORE, ELIOT SPECHT, ORNL — A unique, three-dimensional (3D), single-crystal, MgO, NANOFENCE comprised of single crystal MgO nanowire units was synthesized via epitaxial growth on (100) SrTiO₃ substrates. Individual single crystal MgO nanowire units comprising the nanofence were observed to have high aspect ratios with small diameters of 10-20 nm and long lengths from 100 nm up to 1 μ m. X-ray diffraction shows that the 3D MgO nanofence has an epitaxial relation with (100) SrTiO₃ substrates with only a single {100}<100> orientation and with full-width-half-maximum values of (200) ω -scan and (110) ϕ -scan with 4.5 $^\circ$ and 5.5 $^\circ$, respectively. Such nanofences offer a single crystal, 3D nanotemplate for epitaxial growth of wide-ranging, 3D, electronic, magnetic and electromagnetic nanodevices.

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