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**Effect of pulsed laser deposition parameters on nanocrystalline grain orientation in barium zirconate for fuel cell applications.** ERIC REMINGTON, ALEX SKINNER, University of Alabama at Birmingham, PATRICK KUNG, University of Alabama, RENATO CAMATA, University of Alabama at Birmingham — Solid oxide fuel cells rely on thermally activated conduction of ions through an electrolyte material. Barium zirconate doped with various group III transition metals is predicted to offer improved ionic conductivity at intermediate temperatures (500-700°C) than conventional yttria-stabilized zirconia-based electrolyte materials. We have synthesized thin films of barium zirconate doped with gadolinium by means of pulsed laser deposition. Films were deposited using a KrF excimer laser on Pt substrates at 850°C in a background pressure of 50 mtorr of oxygen from targets prepared in-house by mixing barium zirconate and gadolinium oxide powders. X-ray diffraction studies suggest that preferential crystallographic orientation increases by decreasing target to substrate distance and laser fluence. Preferential crystallographic orientation may lead to improvement in conductivity as measured by impedance spectroscopy.

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