Thin film growth of the p-type semiconductor BiCuOSe by pulsed laser deposition\textsuperscript{1} PAUL NEWHOUSE, PETER HERSH, DOUGLAS KESZLER, Dept. Chemistry, Oregon State University, JANET TATE, Dept. Physics, Oregon State University — Thin films of p-type semiconductor BiCuOSe were prepared by pulsed laser deposition onto fused SiO\textsubscript{2} and single crystal MgO and SrTiO\textsubscript{3} substrates. Their electrical and optical properties were measured. Ca-doped films prepared on MgO or SrTiO\textsubscript{3} substrates are c-axis oriented, and show high electrical conductivity of \(\sim 200\) S/cm and high reflectivity of 30-50\% from \(\sim 0.4-4\) \(\mu\)m. Single phase polycrystalline films on fused SiO2 show lower conductivity of \(\sim 9\) S/cm and reveal a weak transmission turn on near 950 nm (1.3 eV) indicative of the band gap absorption. BiCuOSe is isostructural with the transparent p-type conductor LaCuOSe, but forms at much lower temperatures. Possible applications include use as a solar cell absorber.

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