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Epitaxial Photoactive $CoO/SrTiO_3$ on Si(001) ALEX DEMKOV, HOSUNG SEO, THONG NGO, AGHAM POSADAS, SON HOANG, MARTIN MACDANIEL, The University of Texas, DIRK UTESS, DINA TRYIYSO, GLOANLFOUNDRIES, BUDDIE MULLINS, JOHN EKERDT, The University of Texas — Cobalt oxide (CoO) films were grown epitaxially on Si(001) by atomic layer deposition (ALD) using a thin (1.6 nm) buffer layer of strontium titanate (STO) grown by molecular beam epitaxy (MBE). Reflection high-energy electron diffraction, X-ray diffraction, and cross sectional scanning transmission electron microscopy were performed to characterize the crystalline structure of the films. The CoO films were found to be crystalline as-deposited even at the low growth temperature with no evidence of Co diffusion into Si. *In-situ* X-ray photoelectron spectroscopy (XPS) was used to measure the band alignment of the two heterojunctions, CoO/STO and CoO/TiO_2. The experimental band alignment is compared to electronic structure calculations using density functional theory.

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