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Aberration Corrected Scanning Transmission Electron Microscopy of $(Ca, Sr)Fe_2O_5$ Brownmillerite superlattices[1] DEBANGSHU MUKHERJEE, The Pennsylvania State University, GREG STONE, United States Army Armament Research, Development and Engineering Center , EUN JU MOON, JOSHUA YOUNG, Drexel University, VENKATRAMAN GOPALAN, The Pennsylvania State University, JAMES RONDINELLI, Northwestern University, STEVEN MAY, Drexel University, NASIM ALEM, The Pennsylvania State University — The brownmillerite phase $A_2B_2O_5$ consists of ordered oxygen vacancies in alternate perovskite layers forming chiral tetrahedral chains. The handedness of these tetrahedral chains control the polarization of the structure. The current study focuses on 1-1 brownmillerite superlattices grown on a $SrTiO_3$ substrates using molecular beam epitaxy. The B-site in this structure is iron throughout the superlattice film, while the A-site alternates between calcium and strontium in the superlattice layers. In this study, we use atomic resolution aberration corrected scanning transmission electron microscopy (STEM) to investigate the structure and chemistry of the film-substrate interface as well as the chemical structure of the superlattice. Atom positions are determined to measure displacement vectors of A-site cations in the superlattice structure.

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