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***In situ* resistivity of endotaxial $FeSi_2$ nanowires on Si(110)** PETER BENNETT, DAVID SMITH, Arizona State University, SAM TOBLER, Dixie State College, UT — We present in situ UHV measurements of the resistivity of self-assembled endotaxial $FeSi_2$ nanowires (NWs) on Si(110) using a variable-spacing two-point method with an STM tip and a fixed contact pad. The resistivity at room temperature was found to vary with NW width with approximate values of $\rho_{NW} = 220$ $\mu\Omega$cm at 12 nm and 400 $\mu\Omega$cm at 3 nm. The increase at small W is attributed to boundary scattering, and is fit to the F-S model, yielding values of $\rho_0 = 120$ $\mu\Omega$cm and $\lambda = 7$ nm, for specularity parameter p = 0.5. Upon partial oxidation by exposure to air, the resistivity of a 4 nm NW increased approximately 50%. The resistivity is relatively insensitive to NW size or oxidation, which is attributed to a high concentration of point defects in the $FeSi_2$ structure, with a correspondingly short inelastic electron scattering length. It is remarkable that the defect concentration persists in very small structures.

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