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Transport studies of ultrathin YSi_2 nanowires SABAN M. HUS, HAO HU, VIOLETA IANCU, HANNO H. WEITERING, The University of Tennessee, AN-PING LI, Center for Nanophase Material Sciences, Oak Ridge National Laboratory — Extremely long YSi_2 nanowires have been fabricated via self-assembly during epitaxial growth of Y on the Si (100) 2x1 surface. The thinnest YSi_2 nanowires have a cross section of $\sim$0.4 x1.1 nm^2 and can grow up to 2 μm long. They are among the closest realizations of a one-dimensional conductor. Their electrical transport properties have been investigated with a variable-temperature four-tip scanning tunneling microscope (STM) using ex-situ fabricated contact pads. These ex-situ investigations indicated that the electrical conductivity of single nanowires is thermally activated, following an inverse Arrhenius law. In-situ contact fabrication has been accomplished via a field-induced atomic emission process from a gold STM tip. Details of the in-situ fabrication method and preliminary transport results will be presented. The research at Oak Ridge National Laboratory's Center for Nanophase Materials Sciences was sponsored by the Division of Scientific User Facilities, US Department of Energy.

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