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Deformation mechanism of silver nanowires[1] MARCEL LUCAS, School of Physics, Georgia Institute of Technology, AUSTIN LEACH, MATT MCDOWELL, KEN GALL, School of Materials Science and Engineering, Georgia Institute of Technology, SIMONA HUNYADI, CATHERINE MURPHY, Department of Chemistry and Biochemistry, University of South Carolina, ELISA RIEDO, School of Physics, Georgia Institute of Technology — Silver is the metal which exhibits the highest electrical and thermal conductivity, and has potential applications in electronics, photonics and catalysis. Silver nanowires could serve as interconnects between electronic circuits, catalysts in chemical reactions, or substrates for surface-enhanced Raman spectroscopy. Understanding how their mechanical properties are affected by their structure (size, cross-section geometry) is essential for their integration in nanodevices. Recently, silver nanowires have been synthesized in aqueous solution without surfactant or catalyst. These nanowires were characterized by Atomic Force Microscopy (AFM) and have a diameter ranging from 20 to 40 nm. Their deformation mechanism was studied by AFM nanoindentation and the results were correlated with atomistic simulations of silver nanowires with a pentagonal cross section.

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