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## Novel Shape Memory of Metal Nanowires through LatticeReorientation

By Wuwei Liang

VDM Verlag Jul 2009, 2009. Taschenbuch. Book Condition: Neu. 220x150x7 mm. Neuware - As functional nano building blocks, nanowires are of great technical importance because of their unique structures, properties, and potential applications in nanoscale electronic, photonic, biological, and chemical devices. These applications require a fundamental understanding of the structural characteristics and thermomechanical properties of nanowires. This work focuses on the characterization of the structure and mechanical behavior of metal nanowires. A novel shape memory effect and pseudoelastic behavior of metal nanowires are discovered in molecular dynamics simulations. Specifically, upon tensile loading and unloading, these wires can recover elongations of up to 50%, well beyond the recoverable strains of 5-8% typical for most bulk shape memory alloys. This novel behavior arises from a reversible lattice reorientation driven by the high surface-stress-induced internal stresses at the nanoscale. It exists over a wide range of temperature and is associated with response times on the order of nanoseconds, making the nanowires attractive functional components for a new generation of biosensors, transducers, and interconnects in nano-electromechanical systems. 116 pp. Englisch.



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