

# BIOMECHANICS, BIOENGINEERING & AUDIOLOGY

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## The effect of porosity on mechanical properties of Ti-Ni biomaterials

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TiNi shape memory alloy fibers were prepared by a melt overflow process. The martensitic transformation starting temperature of B2→B19' in the rapidly solidified fibers was 19°C. Cylindrical billets of Ni-rich Ti-Ni alloy with 75% porosity were produced by a vacuum sintering technology using as-cast alloy fibers. The mechanical properties and shape memory properties of the highly porous Ti-Ni alloy is investigated using a compressive test. The plateau of the stress-strain curve was observed at about 7 MPa and resulted in 8% elongation associated with stress-induced B2→B19' transformation. Because of the high porosity of this specimen, the elastic modulus of about 0.95 GPa could be obtained. It was also found that a recovered strain was 5.9% on heating after the compressive deformation. This recovery of the length is ascribed to the shape memory effect which occurs during the martensitic transformation.

### Biography

Yeon-wook Kim is currently a Professor of Department of Advanced Materials Engineering in Keimyung University, Korea. He is in the Review Board of National Research Foundation of Korea. He has completed his PhD in Materials Science and Engineering from University of Wisconsin-Madison. He studies on the effect of rapidly solidification processing on the martensitic transformation behaviors of Ti-based shape memory alloys. His special interests are in fabrication of porous materials for biomaterials using the rapidly solidified powders and fibers of Ti-based shape memory alloys. He has published more than 90 papers in reputed journals.

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