

Measurement by DMA in Tension of Elastic Moduli and Transformation Behaviour of fine Nitinol Medical Wires as function of Stress and Temperature.

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ABSTRACT

In this work, thermomechanical tensile behaviour of thin NiTi wires was investigated by means of a non conventional device which combines a conventional tensile device with a Dynamic Mechanical Analyser (DMA). In this device, the displacement of the specimen upper extremity is controlled by a servo-motor with static drive while the displacement of the lower extremity is controlled by a shaker with dynamic drive. Tensile tests were performed over a wide temperature range (-100°C; 100°C). Wires containing nanograined microstructures were used in order to minimise plastic deformation. These tests are analysed to study dependencies of phase transformations (A-R, R-M and A-M) on stress and temperature and to bring new information concerning the value of the elastic moduli in the different stress-temperature regions.