Sputter-deposited Ni/Ti double-bilayer thin film and the effect of intermetallics during annealing, *Ajit Behera, R. Suman,* Department of Metallurgical & Materials Engineering

In the present study, a double bilayer of a Ni/Ti thin film was investigated. A nanoscale NiTi thin film is deposited in a Ni–Ti–Ni–Ti manner to form a double-bilayer structure on a Si(100) substrate. Ni and Ti depositions were carried out by using d.c. and r.f. power, respectively, in a magnetron sputtering chamber. Four types of bilayers are formed by varying the deposition time of each layer (i.e. 15, 20, 25, and 30 min). The as-deposited amorphous thin films were annealed at 300, 400, 500, and 600 °C for 1 h to achieve the diffusion in between the layers. Microstructures were analyzed using field-emission scanning electron microscope and high-resolution transmission electron microscope. It was found that, with the increase in annealing temperature from 300 to 600 °C, the diffusion at the interface and atomic migration on the surface increase. Copyright © 2016 John Wiley & Sons, Ltd.

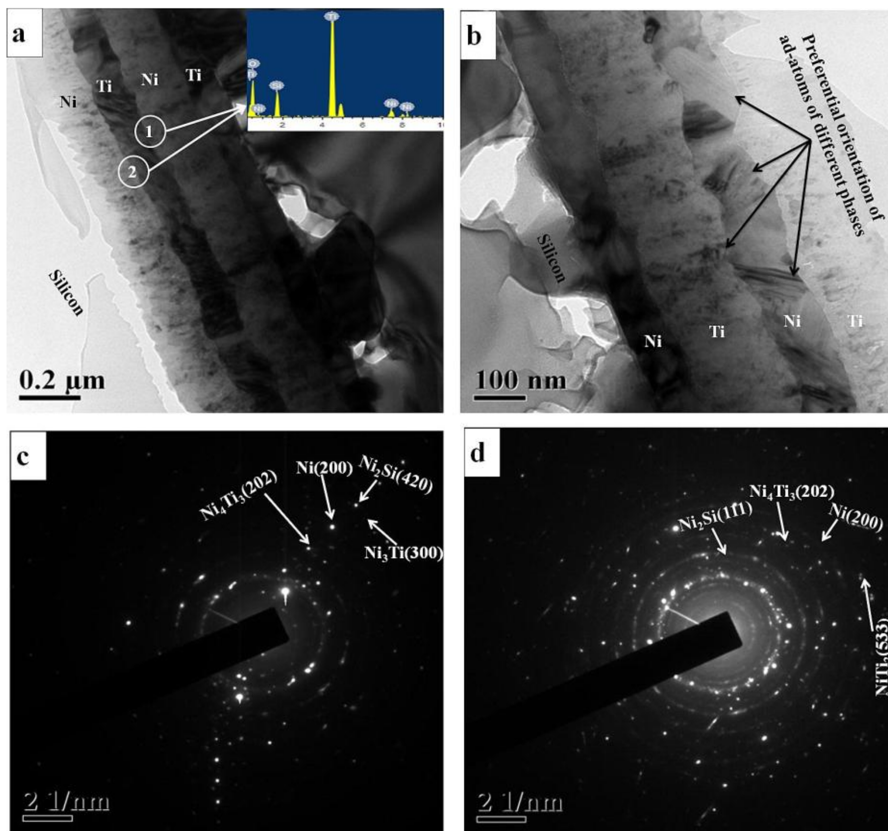

Figure: Cross-sectional TEM micrographs of the type-I bi-layered Ni-Ti thin film grown on Si- substrate, (a) and (b) Bright field images of the Ni-Ti thin film, (c) SAD pattern of Ni layers, (d) SAD pattern of Ti layers