**Electron microscopy study of twins in Ti-Ni shape memory alloys**

**-Why de we observe the microstructure of martensite? -**

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Near equiatomic Ti-Ni alloys exhibit superior shape memory and superelastic properties. These properties are due to its thermoelastic martensitic transformation from B2 parent phase to B19’ martensite upon cooling. Lots of lattice defects are introduced through the martensitic transformation. Above all, lattice defects in the thermoelastic martensite are mainly twin and the martensite forms its microstructure in order to accommodate strain due to volume change between B2 and B19’. This is termed as a self-accommodation. As the result of self-accommodation, characteristic microstructure is observed in the thermoelastic martensite. Another peculiar property of Ti-Ni alloy is anomalous ductility over a wide temperature range in comparison with other intermetallic compounds with B2 type structure such as NiAl. Both attractive functional and mechanical properties in Ti-Ni alloys are closely related to the thermally and mechanically induced twins. In this presentation, recent electron microscopic studies of twins in Ti-Ni shape memory alloys are presented.