



OPEN TALK ANNOUNCEMENT VASP, EVLP

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Speaker:

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Title:

Thermoelastic and Magneto elastic coupling related Study on CoNiAl Ferromagnetic Shapememory alloy using Vibrating Reed method

Abstract:

CoNiAl Ferromagnetic Shape memory Alloy because of its two phase microstructure and gamma phase precipitates is much ductile and practically useful material for sensors and actuators application. Keeping these points in view, $\text{Co}_{39}\text{Ni}_{34}\text{Al}_{27}$ alloy was made using arc melting method and annealed at 1100 C/24h subsequently at 1200 C/72h. The structure and microstructure of the samples were studied using XRD, SEM and EDAX. The structural transformation temperatures were obtained using four probe resistivity measurements. The magnetic properties were studied using VSM within the range of 80 K to 400 K. The structural and magnetic transformation temperatures were found to be $T_{Ms} = 150\text{K}$, $T_{Mf} = 130\text{K}$, $T_{As} = 164\text{K}$, $T_{Af} = 184\text{K}$ and $T_{Ms} = 192\text{K}$, $T_{Mf} = 162\text{K}$, $T_{As} = 194\text{K}$, $T_{Af} = 224\text{K}$ respectively and T_c was found to be same in both the cases and is 260 K. The elastic properties were studied on the reed shaped sample at two different stress levels and till the end of the martensitic transformation. Near the structural transformation temperatures internal friction measurement are shown as sharp peaks and this was also replicated in the sound velocity change. The structural transformation temperatures were slightly suppressed with the stress level. Results on such measurements were presented. To know the Magnetoelastic coupling a Helmholtz coil was wound on the cryostat and was driven with a dc current source to get a field of 20 Oe.
