Highlights

1. $Co_{42}Ni_{31}Al_{27}$ and $Co_{41}Ni_{32}Al_{27}$ have revealed dual phases of BCC (β) and FCC (γ) structure and non-FSMA γ phase is increased by 1.5 times in $Co_{41}Ni_{32}Al_{27}$ sample.

2. The thermal hysteresis (ΔT_M) and Debye temperature (θ_D) is higher for $Co_{41}Ni_{32}Al_{27}$ sample compared to $Co_{42}Ni_{31}Al_{27}$ and ΔT_M is observed to decrease under 150Oe magnetic field.

3. The lattice contribution (C) is increased for $Co_{40}Ni_{33}Al_{27}$ during Phase recovery while electronic contribution decreases.

4. $Co_{42}Ni_{31}Al_{27}$ does not show remarkable enhancement in lattice contribution during shape recovery.

5. The $Co_{41}Ni_{32}Al_{27}$ sample has a larger shape change during phase transition and both martensitic start temperature ($T_{Ms} \approx 260\text{K}$) and Austenitic finish temperature ($T_{Af} \approx 290\text{K}$) with the Curie temperature (T_c) of 330K.

6. The temperature-dependent susceptibility (χ') confirms the higher magnetoelastic recovery in the $Co_{41}Ni_{32}Al_{27}$ sample, indicating an enhancement of magnetic field-induced strain (MFIS).