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ON THE MODELING OF THE EFFECT OF PROCESSING AND HEAT TREATMENT ON ACTUATION BEHAVIORS OF HIGH TEMPERATURE TERNARY and QUATERNARY SHAPE MEMORY ALLOYS

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Abstract

The *cyclic* actuation behaviors of *five* high-temperature shape memory alloys are studied using a recently-developed multi-mechanism material model. An approach is taken to link *few* parameters in the *mathematical* model to specific SMA response characteristics, hence enabling us to account for the effects of material composition, heat treatments and the processing methods used in producing these alloys. The model results were found to be in good agreement with the experimental data obtained for the as-received/processed/aged forms of the $Ti_{50.5}Ni_{24.5}Pd_{25}$, $Ti_{50}Ni_{24.5}Pd_{25}Sc_{0.5}$, and $Ni_{50.3}Ti_{29.7}Hf_{20}$ materials.

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