

## Factors affecting on R-phase transformation temperature in Ti-Ni alloys

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**Abstract:** This study investigated the effect of annealing after cold working and the thermal cycle after annealing treatment and thermal cycle on R-phase transformation temperature ( $R_s$ ) in a Ti-(50.0-50.8)at.%Ni alloy. The ingot was cold-rolled and annealed at 800 °C for 300s alternately down to thin plates of 0.4mm in thickness with a final cold-rolling of a thickness reduction of 10%, 20%, 30% and 37%. The R-phase transformation temperature decreased with increasing annealing temperature in all specimens with different cold working rate, and martensitic transformation temperature decreased to a minimum at annealing temperature of 673K and then increased. In addition, although cold working rate of specimens increase, R-phase transformation temperature is almost same. This indicates that cold working rate did not affect R-phase transformation temperature. The R-phase transformation temperature did not change and the martensitic transformation temperature decrease with increase thermal cycle. It is considered that the R-phase transformation temperature is not affected by dislocations thermal cycle and the martensitic transformation temperature is affected by dislocations thermal cycle. The R-phase transformation temperature depends on annealing temperature, but did depend on dislocation formed by cold-working and thermal cycle.

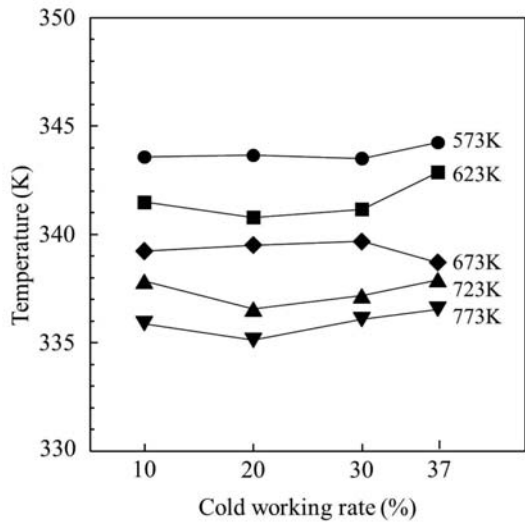


Figure 1 Effect of cold working rate on specimens after annealing at 673K for 3.6ks on  $T^{B2 \rightarrow R}$

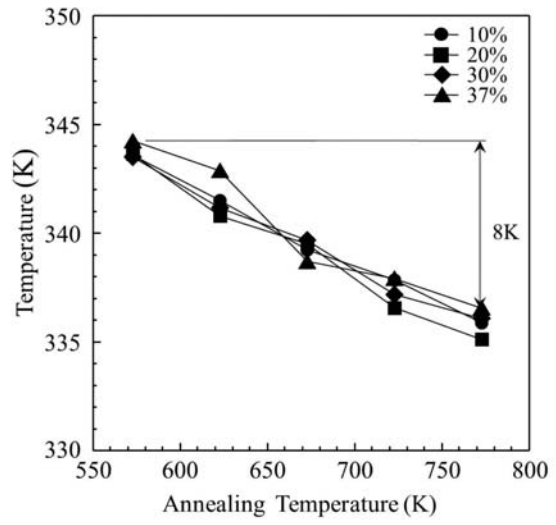


Figure 2 Effect of annealing temperature on specimens after annealing at 673K for 3.6ks on  $T^{B2 \rightarrow R}$

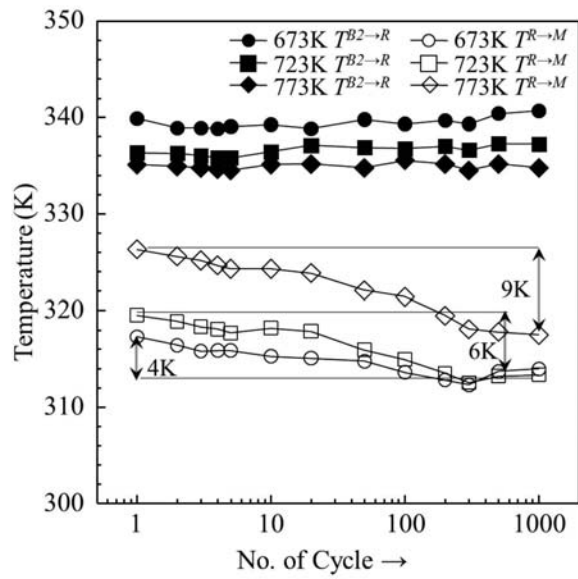


Figure 1 Effect of thermal cycle on specimen annealed at 673-773K for 3.6ks after cold working of 30%