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Effects of cold rolling on the microstructure and properties of Fe-Cr-Ni-Mo-Ti maraging steel

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Abstract

The effects of cold deformation on the evolution of the microstructure and mechanical properties of Fe-Cr-Ni-Mo-Ti maraging steel were investigated. The microstructural changes during cold rolling were observed using optical microscopy (OM), electron back-scattered diffraction (EBSD), transmission electron microscopy (TEM) and X-ray diffraction (XRD), which were related to the mechanical properties as measured by micro-hardness and tensile testing. The remaining austenite in the as-quenched specimens was found to transform into martensite during cold deformation. High-density dislocations were produced in the martensite matrix by plastic deformation, which accelerate the aging response by promoting the formation of η -Ni₃Ti precipitates. The strain hardening was partially conserved due to

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