

HRTEM CHARACTERIZATION OF CARBONITRIDES IN MICROALLOYED STEELS

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The addition of microalloying elements to the steel plays an important role to retard austenite recrystallization when it is deformed during the thermomechanical process. The precipitates inhibit austenite recrystallization, retard the transformation of austenite to ferrite and induce precipitation hardening of ferrite formed during and after transformation. The present research works characterize precipitates in structural microalloyed steels by transmission electron microscopy (TEM) and analysis by high resolution (HRTEM). Analysis by High Resolution Transmission Electron Microscopy (HRTEM) identified precipitates, type and morphology. Energy Dispersive Spectroscopy (EDS) analysis was applied to obtain the chemical composition semiquantitative of precipitates and the matrix. STEM-EDS analysis was also applied to obtain the element profile of precipitates. The results showed the presence of carbonitride precipitates of titanium, Ti (CN), with a circular morphology and size of 10 nm and less.