

Low temperature reversed austenite in the AISI D2 matrix

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As a possibility to understand the mechanisms of austenite stabilization due to stress relief heat treatment in a cold work tool steel, this work has used the concept of matrix steel and evaluated the composition of the matrix of AISI D2 tool steel (MSD2). This work presents the characterization of two conditions: quenched and quenched followed by stress relief heat treatment. The specimens were submitted to optical microscopy, optical microscopy with differential interference contrast, field emission gun electron scanning microscopy, thermodynamic analyses, and X-Ray diffraction. An unexpected low temperature austenite was found when the stress relief heat treatment was applied. The mechanism of low temperature austenite seems to be analogous to the reverted austenite; being the low temperature austenite precipitation in detriment of M23C6 carbides. The low temperature austenite coexists with the retained austenite.

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