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Effect of tempering time on strength and toughness of ultra-low C medium Mn steel

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Ultra-low C medium Mn steel was subjected to controlled rolling and water quenching, and then the steel plate was intercritically tempered at 650°C for 30 minutes and 50 minutes, respectively. The microstructure consisted of duplex laminate structure of tempered martensite and reversed transformed austenite. The high yield strength of 780 MPa and good low temperature toughness of 135 J at -60°C were obtained when the quenched steel was tempered for 30 minutes. As the tempering time increasing to 50 minutes, the yield strength was decreased to 685 MPa, while the tensile strength of 860MPa was unchanged, leading to reduced yield ratio. Moreover, the impact energy at -60°C was slightly enhanced to 150J. The variation of mechanical properties was influenced by the stability of austenite.

Biography

Hong-Yan Wu is working in the Northeastern University of China in The State Key Laboratory of Rolling and Automation.

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