

Microstructure and Mechanical Properties of 0.63C-12.7Cr Martensitic Stainless Steel During Various Tempering Treatments

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Abstract

In this study, the microstructure and mechanical properties of 0.63C-12.7Cr martensitic stainless steel during various tempering treatments were investigated. Experimental results demonstrate that finely distributed primary carbides can be observed in 0.63C-12.7Cr martensitic stainless steel.

It was also found that the measured hardness of 0.63C-12.7Cr martensitic stainless steel after 300 C tempered treatment for 60 minutes can still reach to 677Hv. The variation of measured hardness was found not significant during tempering treatments (200 C - 500 C). Moreover, owing to lower concentration of C and Cr, the martensitic transformation temperature M_s can be increased to 96.4 C comparing to 127 C of SUS440C materials.

Keyword : Carbide, Hardness, Martensitic stainless steel, tempering treatment