TEM Microstructural Investigation of 0.63C-12.7Cr Martensitic Stainless Steel during Various Tempering Treatments

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Abstract

Microstructure of 0.63C-12.7Cr martensitic stainless steel during various tempering treatments was investigated in this study. Results demonstrate that finely distributed primary carbides were observed on 0.63C-12.7Cr martensitic stainless steel. The matrix phase of 0.63C-12.7Cr martensitic stainless steel when tempered below 500 °C was identified as martensite. However, the matrix structure when tempered at 500 °C and 600 °C was found containing of both ferrite and martensite. On carbide particles, mixed of M7C3 and M23C6 particles were observed on all specimens when tempered at 200-600 °C. The amount of M7C3 carbides was found decreased as the tempered temperature was increased.

Keyword：Martensitic stainless steel, Carbide, Tempering treatment, Microstructural investigation