

عنوان مقاله:

Investigation of Wear Mechanism in Quenched and Tempered Medium Carbon-High Chromium Martensitic Steel Using Dry Sand/Rubber Wheel

محل انتشار:

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خلاصه مقاله:

The aim of the present study was to investigate the effect of quenching and tempering temperatures on the microstructure, mechanical properties and the wear characteristics of medium carbon-high chromium wear resistant steel. In addition, the dominant wear mechanisms were studied. For this purpose, austenitizing and tempering temperatures were selected in the ranges of 900- 1000 °C and 300- 500 °C, respectively. Mechanical properties were evaluated through hardness and impact tests as well as wear test (by dry sand/rubber wheel apparatus). Microstructure and wear and fracture surface appearances were investigated using scanning electron microscopy (SEM). Moreover, the measurement of retained austenite was done through X-Ray diffraction (XRD) analysis. The obtained results revealed that the best wear properties were achieved by tempering at 450 °C due to the reduction of tendency to micro-cracking, the decrease in internal stresses, and the improvement of the impact energy. Observing the wear surfaces showed that the wear mechanism for the specimen tempered at 400 °C was a combination of abrasive, adhesive and fatigue wear. However, abrasive wear was the only active wear mechanism for the specimen tempered at 450 °C.

کلمات کلیدی:

Medium carbon-high chromium wear resistant steel, Tempering, Dry sand/rubber-wheel abrasion, Wear mechanism

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