

عنوان مقاله:

The effects of vanadium on microstructure and wear resistance of high manganese steels

محل انتشار:

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خلاصه مقاله:

The high Mn steels (HMS) are currently used in transportation components, large-scale grinders and crusher, and grinding wheels. This study is dedicated to the effects of vanadium content on the properties and wear behavior of Fe-12Mn-1.2C-0.8Si steels containing 0, 0.3, and 0.6 wt.% vanadium as an alloying element. The samples were cast and then subjected to annealing heat treatment and followed by water quenching. The test samples were then cut via an electrical discharge machine. Characterization methods, including phase analysis via XRD and microstructural investigations by scanning electron and optical microscopes, were carried out. The samples were also subjected to hardness and wear tests. The obtained results indicated that the addition of V to the HMS leads to the increased hardness and improved wear properties. Such outcomes were attributed to the role of vanadium in altering the precipitation sites of carbides, from grain boundaries to the grains, and its effect distribution of the carbides.

کلمات کلیدی:

high manganese contained steels, Vanadium, Microstructure, Hardness, Wear resistance

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