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Potential of jatropha seed oil as austempering quenchant for medium carbon steels

Akor and kumar

Abstract

The authors investigated the potential of jatropha seed oil as austempering quenchant for medium carbon steels. The standard test specimens were austenized at 950c, soaked for one hour and austempered for varying periods of 1,2,3,4 and 5 hours. they observed significant increased in tensile strength and impact energy and increased hardness. These values were well in agreement with recommended values of medium carbon steels and hence the authors concluded that jatropha oil can be used as hot bath for austempering medium carbon steels. They have illustrated through the variation of tensile strength, % elongation and hardness with austempering time. The following are the important conclusions drawn by the authors. From the observations and analysis of the results obtained, it can be deduced that jatropha was able to cause the formation of 'bainite' structure at 250⁰c in the medium carbon steel. There is appreciable improvement in mechanical properties of the medium carbon steel when austempered in jatropha seed oil. The as-cast tensile, hardness and impact energy values of 570N/mm²; 196 BHN and 31J increased to 962 N/mm²; 349 BHN and 47J. The results indicate improvement in the mechanical properties of the ductile cast iron.