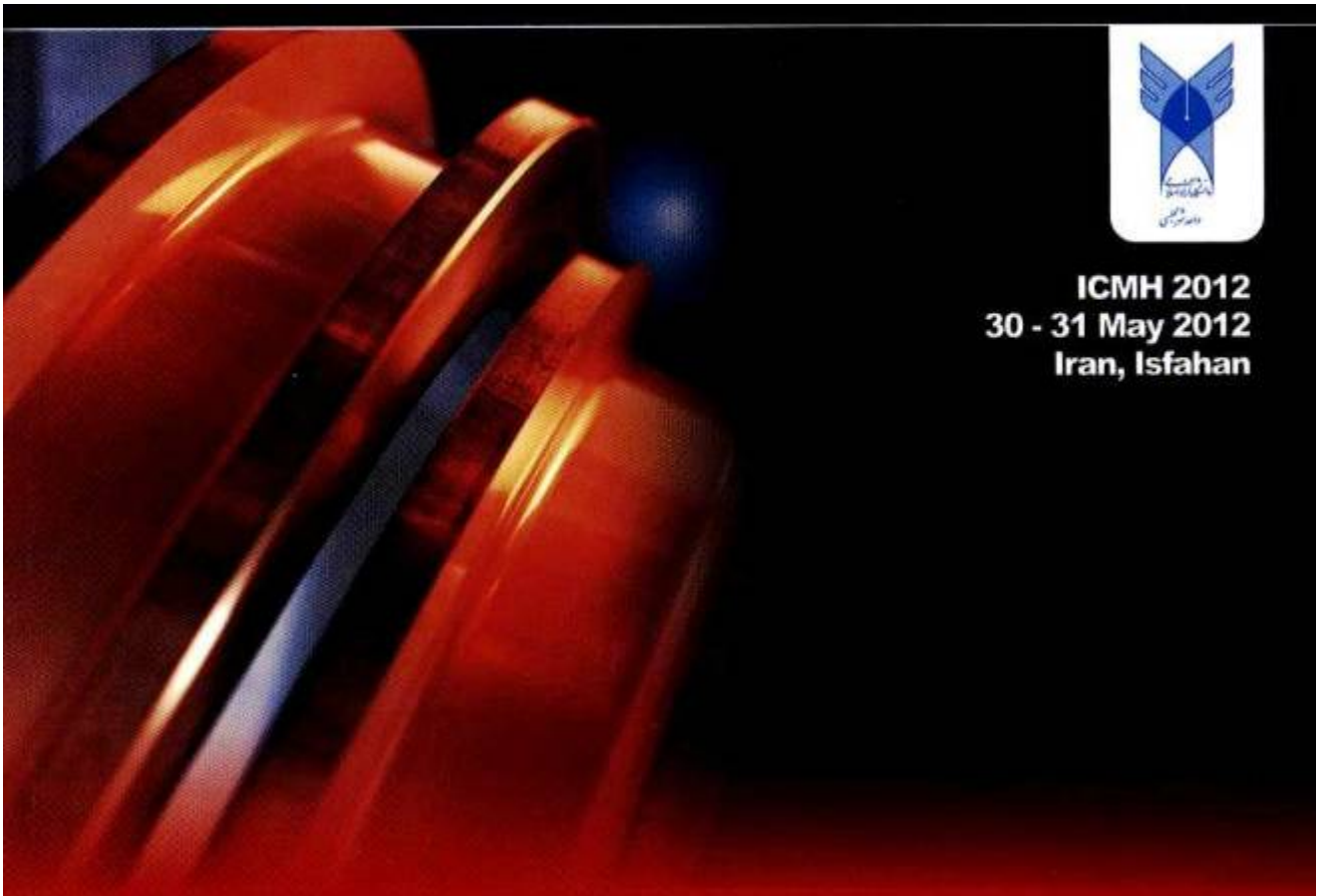

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The Influence of Variation Bainite Morphology on the Mechanical Properties of NiCrMo (BOZ) Steel

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The Influence of Variation Bainite Morphology on the Mechanical Properties of NiCrMo (BOZ) Steel

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Abstract :

One of the most effective ways to increase strength and toughness in steels is forming bainite phase through austempering heat treatment. In this study, the effect of bainite morphology on steel containing chromium, nickel, and molybdenum (Din:34CrNiMo6) that uses to manufacturing parts of cars; for instance, crankshafts, gears, and piston, has been studied. For achieve to the most suitable process to investigation of variation bainite morphology we considered four various temperature (300, 350, 400 and 450 °C), and also two different time (1 and 10 minutes) for austempering heat treatment. After heat treatment process, the microstructure of samples has been studied by optical microscope. Hardness and three-point bending test indicates decreasing hardness, strength, strain and toughness of samples austempered in 10 minutes by increasing austempering temperature wich the cause is bainite morphology change from lower to upper bainite .Tests also indicates decreasing hardness and strength and increasing strain and toughness of samples austempered in one minute which the cause is increasing volume of bainite phase. In fact, samples austempered in 10 minute by various temperature showing differences in the mechanical properties of upper and lower bainite due to constant volume bainite phase. Sample austempered in 10 minutes at 300 °C which contained lower bainite and martensite microstructure shows best mechanical properties.

Keywords : Austempering, Bianite, Morphology, Bending Strength, BOZ

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