



International Journal on Recent Researches In Science, Engineering & Technology

(Division of Mechanical Engineering)

A Journal Established in early 2000 as National journal and upgraded to International journal in 2013 and is in existence for the last 10 years. It is run by Retired Professors from NIT, Trichy. It is an absolutely free (No processing charges, No publishing charges etc) Journal Indexed in JIR, DIIF and SJIF.

Research Paper

Available online at: www.jrrset.com

ISSN (Print) : 2347-6729

ISSN (Online) : 2348-3105

**Volume 5, Issue 3,
March 2017**

JIR IF : 2.54

DIIF IF : 1.46

SJIF IF: 1.329

Experimental studies to find the affect of heat treatment on microstructure and mechanical properties of 6061 Al alloys

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Abstract

The authors made experimental studies to find the affect of heat treatment on microstructure and mechanical properties of 6061 Al alloys. They considered the effect of various cooling rates and precipitation hardening on microstructure and mechanical properties of 6061 Al alloys. The test samples were solution treated at 400⁰c before cooling them in furnace, air and water. The process of precipitation hardening was conducted by solution treating samples at 530⁰c followed by water quench and reheating at 100⁰c and 200⁰c. They found that fast cooling rate produced fine grain and high strength and slow cooling rate produced coarse grain and low tensile strength. Longer precipitated hardening time resulted larger precipitates which related to dropping strength. Precipitation hardness of 100⁰c for seven hours has increased UTS to 625 MPa due to formation of finely dispersed precipitates.