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Effect of Aging Condition on Semisolid Cast 2024 Aluminum Alloy

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Abstract : 2024 Aluminium alloy was squeezed cast by the Gas Induced Semi Solid (GISS) process. Effect of artificial aging on microstructure and mechanical properties of this alloy was studied in the present work. The solutionized specimens were aged hardened at temperatures of 175°C, 200°C, and 225°C under various time durations. The highest hardness of about 77.7 HRE was attained from specimen aged at the temperature of 175 °C for 36 h. Upon investigation the microstructure by using Transmission Electron Microscopy (TEM), the phase was mainly attributed to the strengthening effect in the aged alloy. The apparent activation energy for precipitation hardening of the alloy was calculated as 133,805 J/mol.

Keywords : 2024 aluminium alloy, gas induced semi solid, T6 heat treatment, aged hardening, transmission electron microscopy
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