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Thermo-mechanical large deformation responses of an aluminum alloy processed by Equal Channel Angular Pressing (ECAP)

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A comprehensive study on the large deformation responses of AA 6082-T6 over wide ranges of strain rates ($10^{-4} \leq \leq 5x10^{3}$ s^{-1}) and temperatures (294≤T≤473K) are presented. "Top-down approach" was implemented using ECAP as the processing technique to produce fine grained AA6082. The circular billets of as received AA6082 was solution treated prior to over aging. The over aged billets were then ECAP'ed at room temperature to 4 and 6 passes using route C. The Vickers micro hardness measurements were obtained for each subsequent number of passes and a gradual increase in the hardness values was observed. The room temperature compression experiments were performed on the samples obtained from the ECAPed billets. From the experimental results, a significant increase in the strength with number of passes has been observed. The observed compression experimental responses were modeled using the Power Law and the Johnson-Cook (JC) constitutive model with a modified temperature term. The correlations and predictions of the experimental responses from the JC model were superior to the Power Law.

Biography

Muneer Baig has completed his Ph.D at the age of 30 years from University of Maryland Baltimore County, Maryland, USA. After completion of his study, he joined Creative Systems Design as a research scientist. He is currently working as an assistant professor at King Saud University, KSA for last 2 years. He has worked in several industrial funded projects and projects for National Interest.

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