

Determination of Strain Rate Sensitivity (SRS) for Grain Size Variants on Nanocrystalline Materials Produced by ARB and ECAP

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Abstract : Mechanical behavior of 6082T6 aluminum is investigated at different temperatures. The strain rate sensitivity is investigated at different temperatures on the grain size variants. The sensitivity of the measured grain size variants on 3-D grain is discussed. It is shown that the strain rate sensitivities are negative for the grain size variants during the deformation of nanostructured materials. It is also observed that the strain rate sensitivities vary in different ways with the equivalent radius, semi minor axis radius, semi major axis radius and major axis radius. From the obtained results, it is shown that the variation of strain rate sensitivity with temperature suggests that the strain rate sensitivity at the low and the high temperature ends of the 6082T6 aluminum range is different. The obtained results revealed transition at different temperature from negative strain rate sensitivity as temperature increased on the grain size variants.

Keywords : nanostructured materials, grain size variants, temperature, yield stress, strain rate sensitivity

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