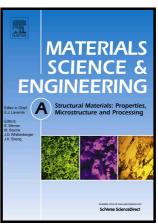
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Effect of the mode of deformation on activation volume of a material

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#### ACCEPTED MANUSCRIPT

### Effect of the mode of deformation on activation volume of a material

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#### Abstract:

This investigation is aimed to examine the compatibility of activation volumes for plastic deformation under tensile and compressive modes of deformation for a material. A series of tension, compression, stress relaxation (SR) and strain rate change (SRC) tests have been carried out to fulfill the objectives using a low carbon steel; in addition microstructural characterization of the steel has also been carried out. The values of activation volume (V) for plastic deformation and the athermal stresses operative at different strain levels have been estimated by thermal activation analyses using the results of SR and SRC tests. The magnitudes of effective activation volume (V\*) for the steel are found to vary between 164 b<sup>3</sup> and 245 b<sup>3</sup> for the tensile and between 149 b<sup>3</sup> and 358 b<sup>3</sup> for the compressive mode of deformation. The obtained results assist

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