

Author's Accepted Manuscript

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

Mamta Kumari, Kalyan Kumar Ray



PII: S0921-5093(15)30521-9
DOI: <http://dx.doi.org/10.1016/j.msea.2015.10.060>
Reference: MSA32911

To appear in: *Materials Science & Engineering A*

Received date: 4 June 2015
Revised date: 15 October 2015
Accepted date: 16 October 2015

Cite this article as: Mamta Kumari and Kalyan Kumar Ray, Effect of the mode of deformation on activation volume of a material, *Materials Science & Engineering A*, <http://dx.doi.org/10.1016/j.msea.2015.10.060>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and a review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

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

Mamta Kumari and Kalyan Kumar Ray*

Department of Metallurgical and Materials Engineering,
Indian Institute of Technology Kharagpur, Kharagpur-721302, India.

*Corresponding Author:

Dr. K. K. Ray, Professor,

Department of Metallurgical and Materials Engineering,

Indian Institute of Technology Kharagpur,

Kharagpur, India-721302

Ph: +91 3222 283278 (off) / +91 9434230710 (M)

Fax: +91 3222 282280/255303 (off.)

E-mail: kkrmt@metal.iitkgp.ernet.in; kalyankumarry@yahoo.com

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^3 and 245 b^3 for the tensile and between 149 b^3 and 358 b^3 for the compressive mode of deformation. The obtained results assist

Download English Version:

<https://daneshyari.com/en/article/7976432>

Download Persian Version:

<https://daneshyari.com/article/7976432>

[Daneshyari.com](https://daneshyari.com)