

Accepted Manuscript

On the comparison of interrupted and continuous creep behaviour of Nanocrystalline Copper: A Molecular Dynamics Approach

Snehanshu Pal, Srishti Mishra, Md. Meraj, A.K. Mondal, B.C. Ray

PII: S0167-577X(18)31063-2
DOI: <https://doi.org/10.1016/j.matlet.2018.07.032>
Reference: MLBLUE 24598

To appear in: *Materials Letters*

Received Date: 29 March 2018
Revised Date: 5 July 2018
Accepted Date: 9 July 2018

Please cite this article as: S. Pal, S. Mishra, Md. Meraj, A.K. Mondal, B.C. Ray, On the comparison of interrupted and continuous creep behaviour of Nanocrystalline Copper: A Molecular Dynamics Approach, *Materials Letters* (2018), doi: <https://doi.org/10.1016/j.matlet.2018.07.032>

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 review of the resulting proof before it is published in its final 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.



On the comparison of interrupted and continuous creep behaviour of Nanocrystalline Copper: A Molecular Dynamics Approach

Snehanshu Pal^{1,*}, Srishti Mishra¹, Md. Meraj¹, A. K. Mondal², B. C. Ray¹

¹Department of Metallurgical and Materials Engineering, National Institute of Technology Rourkela, Rourkela - 769008, India

²Department of Metallurgical Engineering, Indian Institute of Technology (BHU) Varanasi, Varanasi - 221005, India

*Corresponding author: Snehanshu Pal E-mail address: snehanshu.pal@gmail.com; pals@nitrrkl.ac.in. Phone No. +91-661-2462573.

Abstract

Molecular dynamics (MD) analysis of continuous creep (CC) and interrupted creep (IC) behaviour of nano crystalline (NC) Cu having grain size ~ 6 nm has been carried out employing Embedded atom potential. The creep deformation intensifies considerably during IC tests compared to CC process. Higher steady-state strain rates are also observed for IC tests as opposed to CC test. Partial strain recovery is also perceived during cooling and subsequent heating at the end of each cycle of IC test. Dislocation nucleation mechanism has a significant role on the accelerated creep behaviour in the IC tests of the NC Cu. Shockley partial dislocations play a crucial role for such enhanced creep deformation behaviour.

Keywords

Creep; Nanocrystalline Materials; Simulation and Modelling; Molecular Dynamics

Download English Version:

<https://daneshyari.com/en/article/8012497>

Download Persian Version:

<https://daneshyari.com/article/8012497>

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