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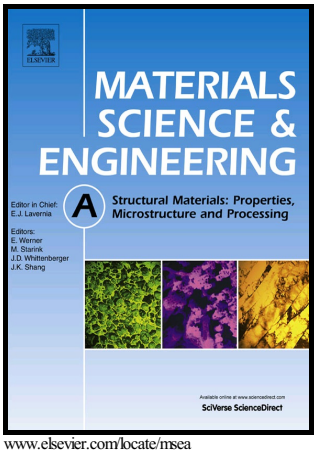

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PII: S0921-5093(16)31443-5
DOI: http://dx.doi.org/10.1016/j.msea.2016.11.078
Reference: MSA34404

To appear in: *Materials Science & Engineering A*

Received date: 16 October 2016
Revised date: 21 November 2016
Accepted date: 22 November 2016

Cite this article as: Sun Ig Hong, Jongun Moon, Soon Ku Hong and Hyoun Seop Kim, Thermally activated deformation and the rate controlling mechanism in CoCrFeMnNi high entropy alloy, *Materials Science & Engineering A* http://dx.doi.org/10.1016/j.msea.2016.11.078

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ABSTRACT

The nature of obstacles to dislocation motion in CoCrFeMnNi alloy was analyzed using the thermally activated deformation analyses at low temperatures. The strong temperature dependence of yield stress and small activation volume in CoCrFeMnNi favor the dislocation glide over the obstacles with high friction stress. The activation volume of CoCrFeMnNi alloy (10-100 b^3) in this study is much smaller than those of conventional FCC metals (10^2~10^3 b^3), but close to those observed in BCC metals (8-100 b^3) and HCP metals (5-100 b^3). The increase of the activation volume with strain supports overcoming the nanoscale inhomogeneity such as co-clusters and/or short range orders as the rate controlling mechanism. The transition of dislocation structure from planar array to cell structure at 20% strain in CoCrFeMnNi reported in the literature can be attributed to the prevalent shearing of nanoscale inhomogeneity with strain.