

전단국부화 정도와 비정질 합금의 소성의 원천

박경원¹, 이창면¹, 이미림¹, Eric Fleury², 이재철^{1*}

¹ Department of Materials Science and Engineering, Korea University, Seoul 136-701, Korea

² Division of Advanced Metals, Korea Institute of Science and Technology, Seoul 130-136, Korea

Degree of shear localization and the origin of the plasticity in amorphous alloys

Abstract

Experiments in a number of binary alloys have demonstrated that a number of metallic glasses exhibiting more plastic strain during homogeneous deformation show lower global plasticity during inhomogeneous deformation. To clarify this finding, the degree of structural disordering occurring during homogeneous deformation in Cu-Zr binary alloys was measured experimentally. Recent theoretical and molecular dynamics simulation results are used to provide guidance regarding the physics that controls these phenomena. In this study, we propose a novel structural parameter, the normalized relaxation heat, which allows the prediction of the global plasticity in this system and perhaps in metallic glasses generally.

Keywords : amorphous alloy, structural disordering, free volume, shear localization, plasticity