

PROCESSING OF ULTRAFINE-GRAINED MATERIALS THROUGH THE APPLICATION OF SEVERE PLASTIC DEFORMATION

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Abstract

Ultrafine-grained (UFG) materials have attracted much attention in recent years because of their remarkable properties such as high tensile strength at ambient temperatures and excellent ductility at elevated temperatures. In addition, processing through the application of severe plastic deformation (SPD) has become an absorbing tool within the last decade because it provides the potential for refining the grain size of polycrystalline bulk metals to the submicrometer or even the nanometer level. Several SPD methods are now available but the more promising procedures appear to be Equal-Channel Angular Pressing (ECAP) and High-Pressure Torsion (HPT). This presentation examines these procedures with special emphasis on the evolution of microstructure during processing and the mechanical properties of the UFG materials.

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