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Achieving heterogeneous structure in hcp Zr via electroplastic rolling

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ABSTRACT

Heterogeneous structure has been widely used to enhance the poor ductility of high-strength nanostructured materials. However, it is still a challenge to form heterogeneous structures in hard-deformed materials. Here, by using electroplastic rolling and subsequent low-temperature annealing, a heterogeneous structure was formed in the hard-deformed *hcp* Zr and exhibited a good combination of high strength and good ductility. Its formation can be attributed to the effective microstructure refinement and high deformation energy storage

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