

The Features of Rhenium Deformation Behavior at Room Temperature

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Abstract. Being the refractory hexagonal close-packed metal, rhenium is characterized by the ductile deformation behavior in the single crystalline state, but sometimes it behaves like a brittle solid in the polycrystalline form. The plasticity of the polycrystalline rhenium depends on the share of the tensile stress in the loading scheme and varies from low under bending to considerable under shearing. The grain boundary sliding is the factor that limited the malleability of rhenium work-pieces; it occurs because the basal slip is the primary deformation mechanism in rhenium at room temperature, as it takes place in zinc and ruthenium.

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