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Microstructure and mechanical properties of W-ZrO₂ alloys by different preparation techniques

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Abstract

The W-1.5wt%ZrO₂ alloys were prepared through azeotropic distillation method and then fabricated by four different processing techniques. The effect mechanisms of original solutions containing different acidity on the physical characteristics of the doped tungsten powders were analyzed. The doped tungsten powders with lower degree of particle agglomerates can be prepared under the condition of the original solution with the pH value of 2. Hot isostatic pressing process is beneficial to obtain higher microhardness and excellent wear resistance compared to conventional sintering, vertical sintering and hot swaging process. Meanwhile, the vertical sintering process can fabricate alloy with the compressive strength of 2090 MPa and the critical

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