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研究论文

通电快速烧结制备超细晶粒纯钨的研究

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摘要:

采用在超高压力下通电快速烧结新方法在不添加任何烧结助剂的情况下制备出相对密度为97.9%、晶粒尺寸小于1 μm的超细晶粒纯钨块体材料,研究了细钨粉块体的致密化行为.在超高压力下通电烧结过程中,超高压力使烧结样品具有高密度,而样品的力学性能则主要得益于通电烧结.与“放电等离子体烧结”方法相比,超高压力下通电烧结不但能更好的保持材料的原始晶粒尺寸,还能进一步细化晶粒.

关键词: 金属材料 钨 超细晶粒 通电烧结 超高压力

Fabrication and characterization of ultra-fine grained pure tungsten by two fast resistance sintering technologies

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Abstract:

Pure tungsten with ultra-fine grain size has been fabricated by a novel sintering method combined resistance sintering with ultra high pressure in the absence of any additives. The relative density of the fabricated material is 97.9% and the average grain size is less than 1 μm. the density of the sintered sample is mainly contributed by the applied ultra high pressure, while the resistance sintering benefit for high mechanical properties of the sintered material. Compared to another fast resistance sintering technology spark plasma sintering, resistance sintering under ultra high pressure shows the advantage of not only retaining the fine grain size, but also further refining the grain size during consolidation.

Keywords: metallic materials tungsten ultra fine grain resistance sintering ultra high pressure

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