

## The effect of powder characteristic on the spark plasma sintering of tungsten

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Tungsten (W) is an excellent material for many engineering applications such as heating source, aerospace and military uses owing to its attractive properties such as high melting point, high density, low coefficient of thermal expansion and superior mechanical properties at elevated temperatures. However, the densification of micro W powders is very difficult and generally requires a temperature over 2000°C because of its high melting point. To enhance the densification of W powders, there are typically three approaches such as activated sintering by the addition of transition metals, nanosintering by particle size refinement and pressure sintering by assisted mechanical pressure. Among the above approaches spark plasma sintering is the

promising method for fabrication of dense material. However, there are few detailed studies on the effect of particle size and processing parameters available in literature. The aim of this work is, therefore, to investigate the densification behavior and microstructure of W which have a variation in powder characteristic such as particle size and size distribution and sintering condition. To evaluate the effect of processing condition on the densification behavior, different W powder size, sintering temperatures and atmosphere were subject to spark plasma sintering. This will help to optimize the sintering process that should achieve the high density W bulk, and to examine the properties related to their microstructure.

### Biography

Sung-Tag Oh got his Dr. rer. nat. degree in the Faculty of Chemistry, University of Stuttgart, Germany. He worked at Fine Ceramics Research Association in Japan as a NEDO Researcher before he moved to Seoul National University of Science and Technology, Korea. His expertise lies in the area of Porous Materials, Nanocomposite Processing, and High Temperature Materials.

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