

Production of Nano-Scale W Powder by Electrical Explosion of Wire Method and its Spark-Plasma Sintering

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The electrical explosion of wires (EEW) has attracted lots of interest in recent years as a new method a pulse electric power is applied to a metallic wire. This causes an explosion of the wire into fine particles of metallic vapor due to its resistance heating. However, it is difficult to control the particle sizes of refractory metals such as W produced by EEW because its sublimation and ionization energy are similar and an effective energy transfer can be hardly controlled. In the present study W nanopowders were produced by EEW, changing processing (Ar, N₂, N₂ +5% H₂), and were subsequently investigated with respect to grain size and (SPS) was studied, which is known to be a very effective method of sintering hard-to-sinter materials and nanopowders with the suppression of grain growth.