

SPARK PLASMA SINTERING: AN EMERGING POWDER CONSOLIDATION TECHNIQUE

Marcus Schaffer

Mentor: Eugene A Olevsky, Ph.D.

Spark-plasma sintering (SPS) is an emerging powder consolidating technique which provides significant advantages to the processing of materials into configurations previously unattainable. SPS consists essentially of the conjoint application of high temperature, high axial pressure and field (plasma) assisted sintering. Sintering technologies are traditionally used for manufacturing ceramic objects and have found uses in the field of powder metallurgy. The SPS temperature, the applied pressure and the SPS time are the controlling input experiment parameters. In the present research, the accuracy of the temperature measurement through the usage of thermocouples and thermo-optical devices has been verified. The feasibility of SPS usage for the fabrication of carbon-nanotube-metal composites for the thermal management applications has been analyzed.