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During field assisted sintering, exposure to an electric field often results in faster sintering rates compared to conventional sintering methods. This research focuses on the influence of electromagnetic fields on grain growth. As a model system, SiC was sintered using conventional pressureless sintering at 2100°C. Samples then underwent conventional annealing, and annealing using spark plasma sintering (SPS) without pressure, at identical and at lower temperatures, and the grain size as a function of annealing time was characterized.

From these experiments, the grain boundary mobility of SiC at 2100°C under conventional heating versus SPS was determined. SPS annealing resulted in a grain boundary mobility which is three orders of magnitude larger than that resulting from conventional annealing. This indicates that the same (or similar) mechanism which promotes rapid sintering during SPS also significantly increases the rate of grain growth. These results will be compared with the role(s) of dopants on the grain growth of ceramics.