

MICROWAVE INDUCED MAGNETIC DECRYSTALLIZATION

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A number of crystalline materials in powder form containing magnetic ions have been decrystallized by exposing them to a 2.45 GHz single mode, quasi-pure magnetic field. Irradiations were carried out by placing samples at the specific location in a microwave cavity tuned to the TE_{103} mode where the magnetic field is maximized and the electric field is minimized. After irradiation, the samples sintered but retained their shape (there was no evidence of macroscopic flow); however, XRD and Raman analysis indicated a complete loss of crystallinity. These observations raise several questions:

- How is electromagnetic energy absorbed in this process?
- How is it stored?
- How is decrystallization induced by the microwave magnetic field?

This paper presents our current understanding of this remarkable phenomenon.