

Magnetic properties of Fe alloy powder coated with Titanium oxide

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In recent years, the soft magnetic composites (SMC) have attracted great interests as the potential applications in electromagnetic circuits, sensors, electromagnetic actuation devices, low frequency filters, induction field coils, magnetic seal systems, and magnetic field shielding. Magnetic powder particles are normally coated by insulating oxides to minimize the eddy current loss in the core loss. For this purpose, we tried to fabricate a coated powder composed of a Fe alloy core and shell layer of TiO₂ via the sol-gel method using titanium butoxide (TBO) as the precursor. A uniform coating of the Fe alloy core with TiO₂ was successfully achievable by controlling the process condition, such as reaction time and concentration of precursor. Also, the effect of dieing pressure during the fabrication of core was studied. Magnetic properties of TiO₂-coated Fe alloy powder were sensitive to the coating conditions of TiO₂. Details will be presented for a discussion.

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