

# Fabrication and characterization of Fe metal powder coated with iron phosphate

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Iron (Fe)metal powder have been used as the core materials of inductors and transformers for high frequency applications. To minimize an eddy current loss, Fe metal powder have been coated with an insulating material. For the same purpose, we tried to fabricate a core-shell structure composed of Fe core and iron phosphate shell. The iron phosphate coating was performed by the phosphating method with acetone solvent. The conditions of the iron phosphate coating, such as the reaction time and the concentration of phosphoric acid, were controlled in order to obtain a uniform coating layer, and the solutions were stirred using a mechanical stirrer andan ultrasound treatment to avoid the agglomeration of Fe powder. The magnetic properties of Fe metal powder coated with iron phosphate were sensitive to these processing conditions. Details will be presented for a discussion.

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