

Structure and Magnetic Properties of Fe-Ferrite SMCs

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Abstract. We investigated the structure and magnetic properties of the soft magnetic composites consisting of iron particles with a size from 125 μm to 200 μm . The powder particles were mechanically smoothed and coated by the two - insulation layers. First SiO₂ layer of was prepared Stöber method and second Ni-Zn/Cu-Zn soft ferrite nano-sized grains layer with different content was prepared by mechanofusion. The ring-shaped compacts were consolidated by the high-pressure compaction. The coercivity, magnetization curves, frequency dependence of total energy losses and complex permeability were analyzed. The analyze revealed the best magnetic properties of the material with a 2% (for permeability) or 5 % (for total energy loss) volume fraction of Ni-Zn/Cu-Zn ferrite coating prepared by mechanofusion.