Magnetization processes in Fe-based soft magnetic composites

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Soft magnetic composites represent a specific class of materials with still expanding application range for various ac and dc electromagnetic applications such as cores with three dimensional isotropic ferromagnetic behaviors for transformers, electromotors, sensors, and actuators. In this work the relations for irreversible permeability at initial magnetization curve were derived and verified on selected type of Fe-based composites. The derivation was based on the Steinmetz law and the linear functions approximation for DC energy losses. The verification of the relationship was based on the comparison of experimental and calculated dependences of the irreversible permeability vs. magnetic induction, where the empirical coefficients in relations were found.

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