Layered alloys for effective magnetic flux concentration in induction heating

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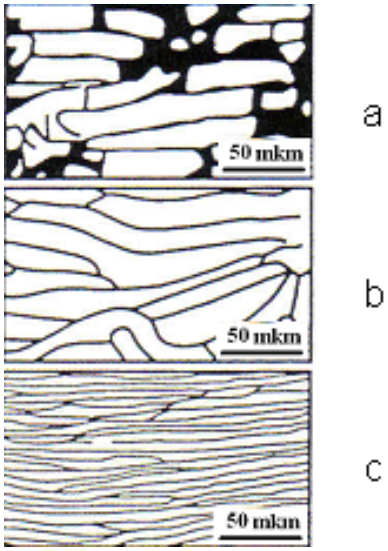
The fundamental requirements for an efficient transformer core material are that it should have a high saturation magnetic polarization and high magnetic permeability, and a low coercivity to minimize hysteresis losses, preferably in combination with a high electrical resistivity so as to minimize eddy current losses. We report about the magnetic and electrical properties of new of soft magnetic materials in respect to apply in an induction heating process. An investigation focuses on the composite layered material. The offered materials properties such as a saturation of magnetization, remanence, coercive of field, and coefficients of efficiency of transformation in the flux controllers were defined. These materials are anticipated as magnetic flux concentration materials for very severe induction heating processes because they possess high permeability and saturation flux density and stable mechanical properties at elevated temperatures.



Schematic cross-section of two phase layered soft magnetic composites based on melt-spun ribbon flake and polymer binder-insulator (a), compacted flakes of two types (b), and two phase alloy rolled with high strains (c).

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