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# The effect of the sol-gel autocombustion synthesis conditions on the Mn–Zn ferrite magnetic properties.

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Streszczenie

Nanocrystalline Mn-Zn ferrite spinel powders were synthesized by combined coprecipitation and sol-gel autocombustion methods. The effect of the precursors used in the sol-gel autocombustion synthesis on the ferrite's structural and magnetic properties was examined. The ferrite powders were characterized by XRD, FTIR, TEM and SQUID magnetometer measurements. All ferrite powders obtained from different precursors, after gel combustion, were pure spinel phase, without secondary phases. The average crystalline size, estimated from Scherrer equation, was 65.9 and 40.8 nm for ferrite obtained from hydroxide and oxalate precursor, respectively. The saturation magnetization at 2 K (112 and 95.7 emu/g) was smaller than that of bulk material. From the hysteresis loop measurements it can be concluded that the obtained materials show ferrimagnetic behaviour at 2 K. The blocking temperature determined from the ZFC/FC magnetization curve was high (~400 K), which suggested a broad distribution in the particle size. Mn-Zn ferrite prepared from hydroxide precursor showed acceptable magnetic properties with a relatively constant magnetic permeability in the frequency range up to 1000 Hz.

Słowa kluczowe

precipitation, sol-grl processes, magnetifc measurements

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