HIGH FREQUENCY LiZn FERRITE PREPARED BY SELF-COMBUSTION METHOD WITH RARE EARTH SUBSTITUTIONS

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It is known that the preparation of the LiZn ferrite in dense polycrystalline form by conventional ceramic processing is difficult because the lithium evaporation implies a limitation of the sintering temperature. So we are mainly interested in the fabrication of dense polycrystalline specimens and we have previously investigated the influence of nonmagnetic oxide additives such as CaO, Na_2O, Sb_2O_3, ZrO_2 [1]. These oxides permit to obtain a substantially increased density at low temperatures without lithia loss.

The aim of the present work is to evaluate whether the rare earth oxides have some influence on the ceramic parameters (grain growth, density, hardness) on the crystallographic (lattice constant) or on the magnetic properties (saturation magnetization, initial permeability, Curie temperature) of the Li-Zn ferrite. Six compounds with formula $Li_{0.3}Zn_{0.4}Fe_{2.26}R_{0.04}O_4$ where R≡Yb, Er, Dy, Tb, Gd and Sm was studied. The results obtained reveal that, by introducing a relatively small amount of R_2O_3 instead of Fe_2O_3, important modifications of properties can be obtained. For example, R_2O_3 shifts the Curie point of Li-Zn ferrite to lower temperature and increases the electrical resistivity with over one order of magnitude. We tried to explain these influences of the rare-earth ions as an effect of their ionic radius.

[1] N. Rezlescu and E. Rezlescu, Phys. Stat. Sol.(a) **147** (1995) 553.

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