HIGH FRECQUENCY NiZn FERRITE PREPARED BY SELF-COMBUSTION METHOD WITH NONMAGNEIC ADDITIVES

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It is known the application of NiZn ferrite for making transducer heads for magnetic recording as a substitute for laminated metallic alloys, in order to improve wear resistance and to reduce the losses. The features of this ferrite are the high mechanical strengh, high hardness, high resistivity, chemical stability and reasonable cost.

The main problem in preparing these polycrystalinne materials is the porosity. This should be less than 1% [1]. To overcome the problem of the density and to optimise the numerous properties of interest such as coercivity, permeability, resistivity, we are investigated the influence of the various nonmagnetic additives as Na_2O, CaO, Sb_2O_3, ZrO_2, K_2O and Li_2O. Using self combustion procedure and materials of high purity, we have succeded in preparing of polycrystalline ferrite, $Ni_{0.36}Zn_{0.64}Fe_2O_4$ with a reduced porosity of about 1.9%. The increase in the density with the increasing additive amount was explained by additives segregation on the grain boundaries. Regarding the others properties, we have found that the CaO and Na_2O increase remarkably the electrial resistivity while Li_2O increases the permeability. From the additives investigated, the triple compositions Na_2O- CaO-Li_2O and Na_2O-CaO-ZrO_2 led to the best results regarding the magnetic and mechanical characteristics of NiZn ferrite acceptable for magnetic head.

[1] E.Hirota et all., Proc.Intern.Conf.Ferrites, Kyoto, Japan, 1980, p.667.

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