

# Electromagnetic properties of composites based on hexaferrites and MCNT at microwaves

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**Abstract** – In this paper there are results of simulation, experimental investigation of electromagnetic characteristics and structure parameters of composite based on nanosized powder of hexaferrite  $\text{Sr}_{0.5}\text{Ba}_{0.5}\text{CoZnFe}_{16}\text{O}_{27}$  and MCNT. MCNT were prepared by catalytic chemical vapor deposition (CVD) method. Parameters of MCNT are: average diameter 18.6 nm; walls thickness 12–14 layers. Nanosized powders of hexaferrite were obtained by self-propagating high-temperature synthesis with master phase more than 85 % in volume.

Synthesized material has the range of signal attenuation is from 5 to 11.5 GHz ( $RL < -10$  dB) when thickness is 2 mm. Same results were obtained for pure hexaferrite with thickness 3.7 mm. Investigation in terahertz showed that absorption coefficient for synthesized material was over than 60 % and absorption coefficient determines by permittivity of MCNT.

Thus, synthesized material based on mixture of hexaferrite and MCNT has comparable reflection coefficient at  $-10$  dB with considerable less thickness. Synthesized material can be used to decrease the intensity of electromagnetic waves. This material has high absorption coefficients and relatively low transmission and reflection coefficients.