

DEVELOPMENT OF NiZnFe₂O₄ WITH ULTRA-LOW DIELECTRIC CONSTANT VALUE FERRITES BY MULTIMODE MICROWAVE SINTERING

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NiZnFe₂O₄ are usually prepared by conventional ceramic procedure, in which the stoichiometric compositions and final microstructures are difficult to control. The prolonged heating may cause constituents to evaporate, thereby modifying the stoichiometry. Volatilization of zinc at high temperature results in formation of Fe²⁺ ions, which in turn increases electron hopping and reduce resistivity. The microwave sintering procedure can offer rapidity in heating that can effectively reduce the sintering time. The microwaves can also alter the microstructure considerably as a result of enhanced diffusion process. In this study, the differences between microwave sintered NiZnFe₂O₄ and conventional sintered NiZnFe₂O₄ will be stressed. The difference in microstructure, magnetic properties, and dielectric properties will be highlighted. The diffusion mechanisms in the case of conventional sintering and microwave sintering will be discussed. The magnetic and dielectric property differences by using Fe₃O₄ and Fe₂O₃ as ingredients will also be discussed.