

## Structural, Magnetic, Dielectric, and Electrical Properties of ZnFe<sub>2</sub>O<sub>4</sub> Nanoparticles

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**Abstract :** ZnFe<sub>2</sub>O<sub>4</sub> spinel ferrite nanoparticles were synthesized by sol-gel auto-combustion method. The synthesized spinel ferrite nanoparticles were annealed at different higher temperature to achieve different size nanoparticles. The as synthesized and annealed samples were characterized by powder X-ray Diffraction Spectroscopy, Raman Spectroscopy, Fourier Transform Infrared Spectroscopy, UV-Vis absorption Spectroscopy and Scanning Electron Microscopy. The magnetic properties were studied by vibrating sample magnetometer. The variation in magnetic parameters was noticed with variation in grain size. The dielectric constant and dielectric loss with variation of frequency shows normal behaviour of spinel ferrite. The variation in conductivity with variation in grain size is noticed. Modulus and Impedance Spectroscopy shows the role of grain and grain boundary on the electrical resistance and capacitance of different grain sized spinel ferrite nanoparticles. Acknowledgment: This work was supported by the Ministry of Education, Youth and Sports of the Czech Republic - Program NPU I (LO1504).

**Keywords :** spinel ferrite, nanoparticles, magnetic properties, dielectric properties

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