In this work the synthesis and characterization Ferrite with the varying concentration of Zn and Mn (x= 0.25, 0.5, 0.75) in Mn\(_x\)Zn\(_{1-x}\)Fe\(_2\)O\(_4\) was carried out which is well studied material for high magnetic property even at very low magnetic field [1]. Various composition of ferrite were synthesized by citrate route method and were annealed at two different temperature to analysis the changes in the crystallinity and morphology. This crystallinity changes were correlated with the Piezomagnetic property of different composites. By performing the XRD analysis it was found that the composites average crystals size was around 20 nm with pure spinal cubic corresponding to the ferrite JCPDS (10-0467) reference. Piezomagnetic properties various was studied by the means of magnetic force microscopy. It was found that Mn\(_{0.75}\)Zn\(_{0.25}\)Fe\(_2\)O\(_4\) composite annealed at 1000°C depicted the best Piezo-magnetic effect, while Mn\(_{0.25}\)Zn\(_{0.75}\)Fe\(_2\)O\(_4\) have better magnetostriction behavior. The better Piezomagnetic properties at high temperature can be related to the better crystalline structure which was also observed in the TEM images. This behavior of the above materials can be utilized in diverse application like magnetic sensors [2] and as a contrast agents in magnetic resonance imaging (MRI).

**Keywords:** Nanocomposites, Magnetic Nanoparticles, Structural Property

**References:**

1] Magdalena Streckova, Radovan Bures, Maria Faberova, Pavel Kurek, Pavla Roupcova “A Novel Composite Material Designed from FeSi Powder and "

[2] R. Gao, Y. Jiang, S. Abdelaziz “All-fiber magnetic field sensor based on magnetic fluid-filled photonic crystal fibers”

Presenting author's email: dkt.phy@gmail.com