

**EFFECT OF FUEL ON
THE AUTO-COMBUSTION SYNTHESIZED
MULTIFERROIC BiFeO₃**

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Bismuth ferrite is one of the most promising single multiferroic materials. It exhibits ferroelectric and antiferromagnetic behavior in wide range of temperatures. Many new applications arise due to possibility of magnetization reorientation by electric field and polarization reorientation by magnetic field [1]. Main problem in usage of BiFeO₃ is difficulty of obtaining pure phase ceramic and high conductivity as a result of Fe non-stoichiometry [2]. BiFeO₃ powders were prepared by auto-combustion method starting from iron and bismuth nitrates. After the process of self-ignition, fine precursor powders were thermally treated for various periods at different temperatures and heating rates. Several fuel to oxidizer ratios (F/O) were examined, and X-rays diffraction results showed that in case of citric acid as a fuel, the purest BiFeO₃ perovskite phase was obtained for F/O = 1/1 and calcination at 600 °C by 4 hours. However, some Bi₂O₃, Bi₂Fe₄O₉ and Bi₂₅FeO₃₉ secondary phases remains in all powders. Effect of other fuels (sucrose, urea) [2,3] and sintering regimes are still to be investigated. Powders were characterized by SEM/EDS, TG/DTA, Raman scattering, particle size distribution and BET surface area measurements. Impedance measurements of BiFeO₃ ceramics are planned.

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