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Effect of C⁶⁺ Ion Irradiation on structural and electrical properties of Yb and Eu doped Bi_{1.5}Zn_{0.92}Nb_{1.5}O_{6.92} pyrochlores MEHMET YUMAK¹, Center for Life Sciences and Technologies Bogazici University, Istanbul, Turkey, AYHAN MERGEN, Department of Metallurgical and Materials Eng., Marmara University, Istanbul-81040, Turkey, ANJUM QURESHI, Sabanci University Nanotechnology Research and Application Center, Orta Mahalle 34956, Tuzla, Istanbul, Turkey, N.L. SINGH, Department of Physics, M.S.University of Baroda, Vadodara-390 002, India — Pyrochlore general formula of A₂B₂X₇ where A and B are cations and X is an anion Pyrochlore compounds exhibit semiconductor, metallic or ionic conduction properties, depending on the doping, compositions/ substituting variety of cations and oxygen partial pressure. Ion beam irradiation can induce the structural disordering by mixing the cation and anion sublattices, therefore we aim to investigate effects of irradiation in pyrochlore compounds. In this study, Eu and Yb-doped Bi_{1.5}Zn_{0.92}Nb_{1.5}O_{6.92} (Eu-BZN, Yb-BZN) Doping effect and single phase formation of Eu-BZN, Yb-BZN was characterized by X-ray diffraction technique (XRD). Radiation-induced effect of 85 MeV C⁶⁺ ions on Eu-BZN, Yb-BZN was studied by XRD, scanning electron microscopy (SEM) and temperature dependent dielectric measurements at different fluences. XRD results revealed that the ion beam-induced structural amorphization processes in Eu-BZN and Yb-BZN structures. Our results suggested that the ion beam irradiation induced the significant change in the temperature dependent dielectric properties of Eu-BZN and Yb-BZN pyrochlores due to the increased oxygen vacancies as a result of cation and anion disordering.

¹Department of Metallurgical and Materials Eng., Marmara University, Istanbul-81040, Turkey

Mehmet Yumak
Bogazici Univ

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