**Abstract**

The lead free NBT–BT ceramics prepared by conventional solid state reaction method were irradiated with 120 MeV Au9+ ions with different fluences. The structural, dielectric and piezoelectric studies were carried out before and after irradiation. The agglomeration and increase of grain size are observed in SEM analysis after the irradiation. The diffuse phase transition disappeared after high fluence of irradiation and the material becomes ferroelectric in nature. The piezoelectric properties were decreased due to the reduced stability of the ferroelectric domains after the irradiation.