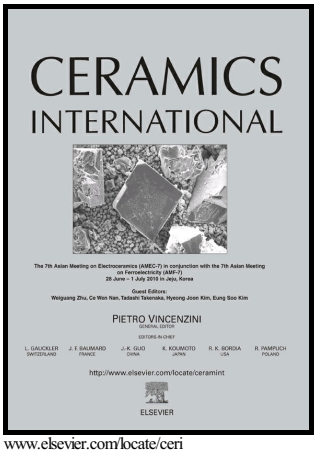

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Abstract

In this study, in order to enhance the energy storage density, 10% $BiMO_3$ doping is performed in $BaTiO_3$ ceramics (M=Al, In, Y, Sm, Nd, La) by a traditional solid-state method. The effects of different M^{3+} radii on the structural characteristics, dielectric properties, and energy storage are investigated systematically. The locations of the M-ions gradually shift from B-site substitutions to A-site substitutions with the increase in the ionic radius, which affect the structural characteristics and the dielectric properties. When $80<R_{M3+}<95.5$ pm, the ceramic has a cubic phase which shows the highest energy density; while out of this range, the dielectric properties of the ceramics are degraded. Specially, the change rate of permittivity of the Sm substituted composition reaches 70% at 100 kV/cm, which might be good for high frequency tunable device application. Typically, combined with the suppression of nonlinearity, polarization