# ELECTRİCAL, STRUCTURAL AND THERMAL PROPERTİES OF NANOCERAMİC (Bİ2O3)1-X-Y(DY2O3)X(SM2O3)Y AND (Bİ2O3)1-X-Y(DY2O3)X(TM2O3)Y

# TERNARY SYSTEM

**M. Kış***Erciyes University, Kayseri, Turkey*mkis@erciyes.edu.tr

**B. Erdoğan***Erciyes University, Kayseri, Turkey*bilge\_erdogan\_@hotmail.com

**S. Durmuş***DumlupınarUniversity, Kütahya, Turkey*semradurmus@dpu.edu.tr

**M. Arı***Erciyes University, Kayseri, Turkey*ari@erciyes.edu.tr

**Keywords:** Solid oxide fuel cell (SOFC); Ceramic electrolyte; Oxygen ionic conductivity; X-ray diffraction; Thermal analysis; 4-point probe technique.

ABSTRACT

Crystal structure and temperature depence of Sm2O3- Dy2O3 and Tm2O3- Dy2O3 doped bismuth trioxide (Bi2O3) tenary solid solutions have been investigated. The (Bi2O3)1-x-y(Dy2O3)x(Sm2O3)y and (Bi2O3)1-x-y(Dy2O3)x(Tm2O3)y ternary systems were obtained with x=20,10 mol % and y=20,10 mol % dopant concentrations. The temperature dependence of the electrical properties of *-*phase of solid solution samples were measured by d.c. four point probe technique. The crystallographic structure of the samples were characterized by X-ray powder diffractions (XRD). The unit cell parameters were determined from the powder diffraction patterns. Thermal behavior and stability of the phases were investigated by Differential Thermal Analysis-Thermo Gravity (DTA-TG).