246	**Synthesis and characterization of β-phase $(Bi_2O_3)_{1-x-y}(Ho_2O_3)_x(Eu_2O_3)_y$ ternary solid solution** *Selma Erat [1], Meral Gokkoyun [2], Semra Durmus [2], Mehmet Bozoklu [2], Artur Braun [2], Hulya Metin [3], Mehmet Ari [2]* *[1] EMPA - Swiss Federal Laboratories for Materials Testing & Research, Überlandstrasse 129, 8600 Dübendorf, Switzerland* *[2] University of Erciyes, Faculty of Science and Art, Department of Physics, 38039 Kayseri, Turkey* *[3] University of Mersin, Faculty of Science and Art, Department of Physics, 33343 Mersin, Turkey* Solid electrolytes such as polymorphs of Bi_2O_3 are essential components in the production of solid state electrochemical devices especially solid oxide fuel cell (SOFC), due to their high oxygen ionic conductivity. In this study, the polymorphic phase transitions, crystallographic and electrical properties and Ho_2O_3-Eu_2O_3 content dependence of the lattice parameters of the ternary $(Bi_2O_3)_{1-x-y}(Ho_2O_3)_x(Eu_2O_3)_y$ system have been investigated. The dominant β-phase of the system has been obtained at 700°C. It has been found that, the unit cell parameters of the β-phase system increase slightly with the increasing Ho_2O_3 content. In order to understand the mechanisms of the ionic oxygen conductivity of the system, possible explanations depending on the electrical, structural and morphological properties will be discussed.
247	**Characterization of ternary solid electrolyte $(Bi_2O_3)_{1-x-y}(Gd_2O_3)_x(Eu_2O_3)_y$** *Selma Erat [1], Ozgul Demir [2], Meral Gokkoyun [2], Semra Durmus [2], Mehmet Bozoklu [2], Artur Braun [1], Hulya Metin [3], Mehmet Ari [2]* *[1] EMPA - Swiss Federal Laboratories for Materials Testing & Research, Überlandstrasse 129, 8600 Dübendorf, Switzerland* *[2] Erciyes University, Faculty of Science and Art, Department of Physics, 38039 Kayseri, Turkey* *[3] University of Mersin, Faculty of Science and Art, Department of Physics, 33343 Mersin, Turkey* The aim of this study is to investigate the polymorphic phase transitions, crystallographic and electrical properties and Gd_2O_3-Eu_2O_3 content dependence of the lattice parameters of the ternary solid solution $(Bi_2O_3)_{1-x-y}(Gd_2O_3)_x(Eu_2O_3)_y$. The SEM, XRD, TG/DTA and electrical measurements have been carried out in order to clarify structural and thermo-electrical transport properties. The mechanisms of the ionic oxygen conductivity of the system have been discussed by using the electrical and structural measurement results. The dominant β-phase of the system has been obtained at 700°C. The obtained unit cell parameters of the system increase with the increasing Gd_2O_3 content. This ternary solid solution can be used as an essential component in the production of solid state electrochemical devices especially solid oxide fuel cell (SOFC), due to their high oxygen ionic conductivity.