ABSTRACT

The work contains: 100 p., 39 fig., 10 tabl., 49 refer. Object of research - ZrO_2 stabilized Y_2O_3 (8YSZ)

The purpose of this work is to approbate influence of sintering temperature effect on ZrO_2 stabilized with 8 mol % Y_2O_3, on its structure and properties, as well as comparison of them with foreign analogue.

Methods of samples manufacturing: pressing made with use of hydraulic press, sintering made with use of muffle inductive furnace.

Method of hydrostatic weighing was used to study porosity of electrolyte samples, structure and mechanical behavior of the electrolyte was studied with complex methods of physical material science: SEM (scanning electron microscopy) and biaxial bending strength testing, with method of X-ray diffraction analysis phase content was investigated, as also was studied conductivity of electrolyte samples.

The dependence of temperature of sintering on porosity of ZrO_2 ceramics stabilized with Y_2O_3 was established, and the effect of porosity with temperature of sintering on the strength and ionic conductivity of samples was determinated as well.

The properties of electrolyte on zirconium dioxide basis were obtained and compared with foreign analogue.

Keywords: POWDER, CERAMICS, CERAMIC FUEL CELLS, SOLID ELECTROLYTE, ZIRCONIUM DIOXIDE, YTTRIUM-STABILIZED, MECHANICAL BEHAVIOR, ION CONDUCTIVITY.