

BEHAVIOUR OF PROTON CONDUCTORS UNDER REACTOR IRRADIATION

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The proton conductors on the base of barium and strontium cerates are interested as perspective electrolytes for solid oxide fuel cells (SOFC) for hydrogen power engineering and technologies. The complex investigations of chemical and radiation stability of proton conductors under reactor irradiation were carried out.

It was shown that low temperature irradiation of barium and strontium cerates brings to monotonous increase of proton, oxygen and carbon concentration in the oxides with growth of the irradiation dose.

Phase transformation in the oxides irradiated in the reactor at 620 °C took place at their annealing in the laboratory conditions after irradiation. This phase transformation was connected with formation of CeO₂ phase.

Mathematical models describing gas – proton conductor exchange processes were suggested and corresponding characteristics of the processes were determined.

The processes taking place in the oxides during their irradiation and post irradiation treatments are discussed.