Contribution ID: **116** Type: **Poster**

Investigation of the radiation resistance and optical properties of new composite thermal barrier coatings

Tuesday 19 September 2023 17:07 (1 minute)

Improved thermal barrier coatings (TBCs) will enable future gas turbines to operate at higher gas temperatures. Considerable effort is being invested, in identifying new materials with even better performance than the current industry standard, yttrium stabilized zirconia (YSZ). TBCs are also supposed to be applied in spacecrafts as protective layer against heat. The operation of spacecrafts in cosmic conditions in turn suggests continuous irradiation with cosmic rays, particularly with MeV energy protons, electrons and neutrons. Therefore, it is very important to investigate the behavior of such barrier coatings under irradiation conditions. In this work, we investigate the radiation resistance of TBCs based on silicate compounds obtained by a hydrothermal microwave method by using proton and neutron beam irradiation. For this purpose, zinc silicates and cerium-doped zinc silicates were irradiated with l8 MeV protons with doses 1013-1015 p/cm2 and neutrons with doses 1013, 1015 n/cm2. The diffuse reflectance measurements and X-ray diffraction analysis (XRD) of materials before and after irradiation indicated that the samples have high radiation resistance, and the samples maintain the crystalline structure.

Authors: Dr SARGSYAN, Anahit (M.G. Manvelyan Institute of General and Inorganic Chemistry); Mr MANUKYAN, Andranik (Alikhanian National Science Laboratory); BADALYAN, Anush (A. I. Alikhanyan national science laboratory (Yerevan Physics Institute)" foundation); Mrs ARESTAKYAN, Arevik (Alikhanian National Science Laboratory); Dr ALEKSANYAN, Eduard (Alikhanian National Science Laboratory); Dr GRIGORYAN, Norik (Alikhanian National Science Laboratory); Prof. HARUTYUNYAN, Vachagan (Alikhanian National Science Laboratory); Dr BAGHRAMYAN, Volodya (M.G. Manvelyan Institute of General and Inorganic Chemistry)

Presenter: BADALYAN, Anush (A. I. Alikhanyan national science laboratory (Yerevan Physics Institute)" foundation)

Session Classification: Poster session II

Track Classification: e–/e+ beams interaction in solids: General Properties of Radiation from Relativistic Particles