Contribution ID : **122** Type : **Poster**

Neutron transmutation studies of Fe2O3

Neutron transmutation, as a process, has traditionally been used to dope semiconductor materials in order to control the electrical conductivity and electronic structure of the valence and conduction band region which is vital for the function of a majority of semiconductor based technologies. A novel approach is introduced by the authors to use the nuclear process of neutron transmutation to effectively dope transition metal oxide materials. In the case of $FeTiO_2$ a number of dopants are produced, in particular Cr, Mn, and V. This cocktail of dopants can potentially be adjusted to suit an application or area of study. This preliminary study documents the process involved in transmutation doping of a transition metal oxide and characterises some basic macroscopic properties such as magnetism, thermal conductivity, resistivity, etc., as well as fundamental properties in terms of electronic structure. Furthermore the effect of the irradiation on the virgin material, on both a macroscopic and atomic level is presented.

Primary author(s) : CLEMENTS, Richard; Dr ERSEZ, Tunay (ANSTO); Dr STAMPFL, Anton (Australian Nuclear Science and Technology Organisation)

Presenter(s) : CLEMENTS, Richard

Session Classification : Poster Session B

Track Classification : Accelerator/Radiation Sciences and Technology