

60. Photoluminescence Characterization of Europium Doped Zirconia

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ABSTRACT

Zirconia is one of the important ceramics which has unique properties. The excellent electrical, mechanical, optical and thermal properties of Zirconia, makes it a good choice for application such as: structural materials, thermal barriers coating, solid oxide fuel cell electrolytes, air-fuel ratio sensors for automotive applications and semiconductor materials, its stable photochemical properties makes it directly applicable to photonics. As reported in literature, Zirconia can be used as a catalyst in various reactions such as: isomerization of alkanes, dehydration of alcohols, and decompositions of nitrous oxides. Zirconia implants are becoming increasingly important in the field of dental medicine because of their good mechanical properties, biocompatibility, and for aesthetic reasons. Zirconia (ZrO_2) and Ytria stabilized Zirconia ($Y-ZrO_2$) have wider applications such as hip and knee prostheses, hip joint heads, temporary supports, tibial plates, and dental crowns. Zirconia exhibits three well-established polymorphs, the monoclinic, tetragonal and cubic phases. The structures of the tetragonal and the cubic phases of zirconia can however be stabilized at room temperature by the incorporation of many different metal cations. To determine the structure of zirconia and stabilized zirconia prepared by different methods and at various temperatures, the photoluminescence study of Zirconia and europium doped zirconia was undertaken. Here we report the photoluminescence characterization of the doped and undoped Zirconia.

Keywords: Zirconia, Photoluminescence, Europium.