

Survey analysis of dental ceramic materials based on yttria oxide-stabilized zirconia

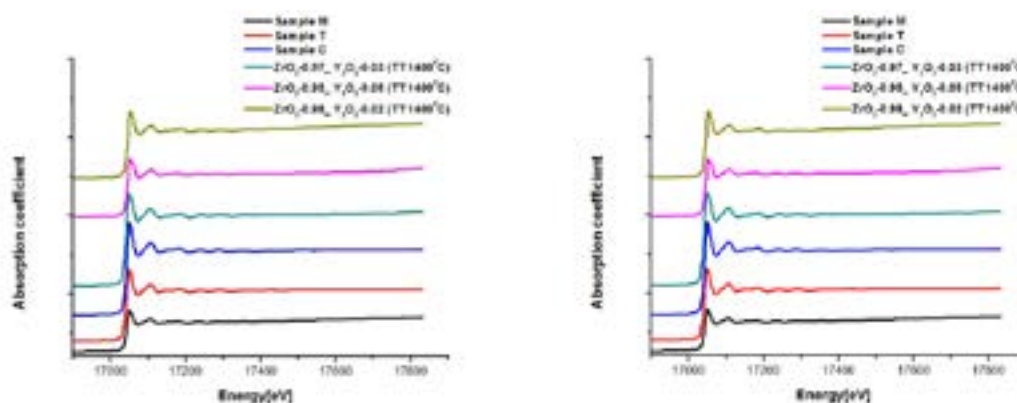
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Statement of the Problem: The special properties of ceramic materials are becoming increasingly important for many applications in electrical, chemical and mechanical engineering. Oxide ceramic materials are used in a wide range of industries, including mining, aerospace, electronics, medicine, etc. These materials show a high strength and hardness, as well as a thermal, cracking, and corrosion resistance. Ceramics are considered as popular engineering materials due to their excellent mechanical properties: good fracture toughness, high strength, elastic modulus, and wear resistance, used in many engineering applications such as engine elements, valves, cutting tools, and moulds. In recent years, YSZ with its superior combination of mechanical properties and chemical inertness has been employed in the biomedical field as an implant material. The main aim of the present study is to investigate how the yttrium (III) oxide can influence the formation of monoclinic zirconia crystalline phase in ceramics. The ceramic systems in the xY_2O_3 (100-x)ZrO₂ compositions where x= 2,3 and 5% Y₂O₃ were synthesized by sintering method in alumina crucibles at 1400°C for two hours. For this work, we compared the samples obtained in our laboratory with those used in the medical market, called sample M, T and C. For all samples were characterized by investigations of XRD, and XAS analysis. The EXAFS analysis of absorption coefficient was processed by computer codes CDXAS, XAS and IFEFFIT.



Biography

Marius Rada is Senior Research Scientist II at The National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania. As a Scientist Researcher or Principal Investigator, he led a number of national research grants, in the areas of material science with applications in the recycling of the car batteries and dental ceramics. He has published over 45 papers in ISI journals and has published 1 book and 2 chapters of the book.

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