

Chemical durability, electrical and dielectric properties of the ternary system $(50-x)K_2O-xMnO-50P_2O_5$ phosphate glasses



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Abstract

Potassium phosphate glasses containing MnO ranging from 20 to 35 mol % have been synthesized using melt-quenching method. The amorphous nature of the samples was confirmed by XRD. The chemical durability of these studied glasses increases with MnO content. Glasses having more than 30 mol% MnO had an excellent chemical durability. The electrical and dielectric parameters were measured in the frequency range from 10 KHz to 1 MHz in the temperature range from room temperature to 550°C. It was observed that the values of ac conductivity increase with frequency. The conductivity of all the glasses increases with temperature following the Arrhenius law. Activation energy was found to increase with raise in amount of manganese oxide and decrease with the frequency. It was also observed that the values of dielectric constant and loss factor enhance and decrease respectively with increasing temperature and frequency. These results agree with a closer structure and act in a manner that manganese enters the glassy matrix as a network former character.

Biography

Pr. Mouloud EL MOUDANE was born in 1970 in Khemisset City, Morocco. He received his Ph.D. in Applied Chemistry from Ibn Tofail University, Kenitra, Morocco in 2000. He had published many researches in international journals indexed Scopus and presented several communications in symposia and national/international meetings. He is a reviewer in many peer-reviewed international journals published by Elsevier, Springer, Taylor and Francis, etc. His main research interests are in the field of Materials Science, especially elaboration and characterization of phosphate glasses using X-Ray Diffraction (RXD), Differential Scattering Calorimetry (DSC), Infrared and Raman Spectroscopy, X-Ray fluorescence spectroscopy. Recently, his research focused on Corrosion Science and estimation of thermo-physical properties using geometric models and mathematical equations. EL MOUDANE is an expert in Intellectual Property (WIPO).



International Conference on Smart Materials and Nanotechnology | July 23-24, 2020

Abstract Citation: El Moudane M, Chemical durability, electrical and dielectric properties of the ternary system $(50-x)K_2O-xMnO-50P_2O_5$ phosphate glasses, Smart Materials Congress 2020, 2nd International Conference on Smart Materials and Nanotechnology, July 23, 2020| Webinar, Page 8