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Préparation and electrical conductivity of potassium phosphate glasses containing Al2O3

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The effect of Al2O3 content on electrical conductivity and glass stability against crystallization in the system KH2PO4–Al2O3–P2O5 was investigated using Raman, IR, and impedance spectroscopies. DSC observations were carried out on glasses from a series of KH2PO4/(1 − x) P2O5/x Al2O3, with x = 0, 0.5, 0.1, 0.2 and 0.3 mol, to détermine the relative glass stability. The DSC observations indicate that from x = 0.1 the glasses become more stable. For this composition (x = 0.1) the conductivity, which was obtained by a cimpedance spectroscopic studies, was 7.0 × 10−6 S•cm−1 at room temperature. Spectroscopic investigations reveal the depolymerization of the phosphate glass network by systematic conversion of Q2 structural units into Q1 and finally into Q0 structural units. Even though Q2 to Q1 conversion is taking place due to breaking of P-O-P linkages, formation of P-O-Al linkages provide cross linking between short P-structural units, which make the glass network more rigid.

Biography

"Fatma Zahra SOUISSI" graduated from the Chemistry Department of the University of Sfax, Tunisia in 2018 obtained her doctorate from the same university by doing research internships at the University of Maine at the Faculty of Science and Technology of Le Mans, these research studies are on the preparation and physicochemical characterization of new materials. she did her master's in 2012 in collaboration between the University of Sfax and the University of Maine also in the laboratory of oxide and fluoride glasses of the chemistry departments, she worked on the preparation of new glasses of BaBr fluoride fluoride glasses doped with trace Europium synthesis In a glove box and characterization by DRX, DSC, ATGATD, Flurescence. In 2010 she finished her fundamental degree in physics and chemistry. Currently researcher and teacher at the Higher Institute of Water Science and Technology in Gabes Tunis.