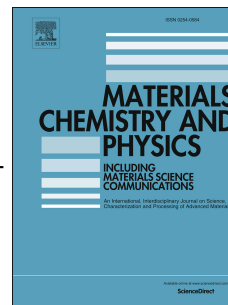


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**Effects of Fe₂O₃ content on ionic conductivity of Li₂O-TiO₂-P₂O₅ glasses and
glass-ceramics**

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Abstract

In this study, Li₂O-TiO₂-P₂O₅-x(Fe₂O₃) (x = 0, 2.5, 5 and 7.5 weight part) glass and glass-ceramics were synthesized through conventional melt-quenching method and subsequently heat treatment. Glass samples were studied by UV-visible spectroscopy and crystallized samples were characterized by differential thermal analysis, X-ray diffractometry and field emission scanning electron microscopy. Besides, electrical properties were examined according to the electrochemical impedance spectroscopy techniques.

Experimental optical spectra of the Fe₂O₃-doped glasses revealed strong UV absorption band in the range of 330-370 nm, which were attributed to the presence of Fe³⁺ ions. The major crystalline phase of the fabricated glass-ceramics was LiTi₂(PO₄)₃. However, Li₃PO₄ was also identified as the minor one. Considering the impedance spectroscopy studies, ionic conductivity of Fe₂O₃ containing glasses was higher than that of the base glass. Additionally,

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