Thermal, structural and magnetic properties of zinc-tellurite glasses containing natural ferrite oxide

Publons ID	7909979
Wos ID	WOS:000324562900077
Doi	10.1016/j.matlet.2013.06.109
Title	Thermal, structural and magnetic properties of zinc-tellurite glasses containing natural ferrite oxide
First Author	Widanarto, W.; Sahar, M. R.; Ghoshal, S. K.;
Last Author	Effendi, M.
Authors	Widanarto, W; Sahar, MR; Ghoshal, SK; Arifin, R; Rohani, MS; Effendi, M;
Publish Date	OCT 1 2013
Journal Name	MATERIALS LETTERS
Citation	22
Abstract	Natural ferrite oxide doped zinc-tellurite glasses are synthesized using the melt quenching technique at 850 degrees C with chemical composition of (80-x)TeO2 center dot xFe(3)O(4)center dot 20ZnO (x=0, 0.5, 1, and 2) in mol%. Precursor nanosized particles of natural magnetite are used as raw material of the ferrite oxide. A differential thermal analyzer, an X-ray diffraction spectroscope and a vibrating sample magnetometer are used to characterize thermal stability, structure, and magnetic properties of the glasses, respectively. The vibrating sample magnetometer reveals the paramagnetic nature of the ferrite oxide with magnetic susceptibility of 4.05 x 10(-5) m(3) kg(-1). Incorporation of oxide in the glasses affects the thermal stability factor, structure and magnetic properties of the glasses. The stability factor increases from 69 to 102 degrees C and the glass structure exhibits an amorphous structure. The magnetization curve with a very small hysteresis (M-r=7.0 x 10(-3) emu g(-1), H-c=1.7 x 10(-2) T) and high saturation field can be observed on the addition of 2 mol% ferrite oxide. This indicates the existence of ferrimagnetic cluster formation in the glass matrices. Our method is new, economic and may contribute towards the development of magnetooptic devices based on Zinc-tellurite glasses. (C) 2013 Elsevier B.V. All rights reserved.
Publish Type	Journal
Publish Year	2013
Page Begin	289
Page End	292
Issn	0167-577X
Eissn	1873-4979
Url	https://www.webofscience.com/wos/woscc/full-record/WOS:000324562900077
Author	Dr.Eng MUKHTAR EFFENDI, S.Si, M.Eng