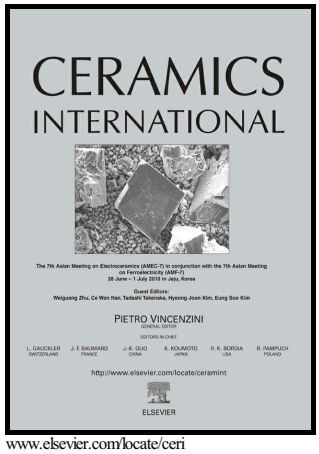

www.elsevier.com/locate/ceri

Bismuth and lead oxides codoped boron phosphate glasses for Faraday rotators

B.A. Sava, Lucica Boroica, M. Elisa, O. Shikimaka, D. Grabco, M. Popa, Z. Barbos, R. Iordanescu, A.M. Niculescu, V. Kuncser, A.C. Galca, M. Eftimie, R.C.C. Monteiro

PII: S0272-8842(17)32915-2
DOI: https://doi.org/10.1016/j.ceramint.2017.12.205
Reference: CERI17085

To appear in: *Ceramics International*

Received date: 24 July 2017
Revised date: 7 November 2017
Accepted date: 27 December 2017

Cite this article as: B.A. Sava, Lucica Boroica, M. Elisa, O. Shikimaka, D. Grabco, M. Popa, Z. Barbos, R. Iordanescu, A.M. Niculescu, V. Kuncser, A.C. Galca, M. Eftimie and R.C.C. Monteiro, Bismuth and lead oxides codoped boron phosphate glasses for Faraday rotators, *Ceramics International,* https://doi.org/10.1016/j.ceramint.2017.12.205

Bismuth and lead oxides codoped boron phosphate glasses for Faraday rotators

B. A. Sava[a], Lucica Boroica[a*], M. Elisa[b], O. Shikimaka[c], D. Grabco[c], M. Popa[c], Z. Barbos[c], R. Iordanescu[b], A. M. Niculescu[a], V. Kuncser[d], A. C. Galca[d], M. Eftimie[e], R. C. C. Monteiro[f]

[a]National Institute for Laser, Plasma and Radiation Physics, Laser Department, 409th Atomistilor Str., RO-77125, Magurele, Bucharest, Romania.

[b]National Institute of Research & Development for Optoelectronics - INOE 2000, 409th Atomistilor Str., RO-77125, Magurele, Bucharest, Romania.

[c]Institute of Applied Physics, Academy of Sciences of Moldova, 5 Academiei str., MD-2028, Chisinau, Republic of Moldova.

[d]National Institute of Materials Physics, Laboratory of Magnetism and Superconductivity, 405th Atomistilor str., RO-77125, Magurele, Romania.

[e]University "Politehnica" Bucharest, 313rd Splaiul Independenței str., RO-60042, Romania.

[f]Department of Materials Sciences, (CENIMAT/I3N), Faculty of Sciences and Technology, Universidade Nova de Lisboa, 2829-516 Caparica, Portugal.

[*]Corresponding author: 409th Atomistilor Str., RO-77125, Magurele, Bucharest, Romania, phone: +40729990594, boroica_lucica@yahoo.com.

Abstract

New magneto-optical vitreous materials were obtained by melting-quenching technique comprising wet route raw materials preparation. The glass has the following composition in oxide mol. %: 10 Li_2O, 9 Al_2O_3, 5 ZnO, (35; 20; 50) B_2O_3, (35; 50; 20) P_2O_5, 3 Bi_2O_3, 3 PbO, phosphorus and boron oxide being the vitreous network formers. It was also prepared a similar reference glass composition but without Bi_2O_3 and PbO. Optical and structural characterization by ultraviolet-visible (UV-Vis), Fourier Transform Infrared (FTIR) and Raman Spectroscopy of the bulk glasses showed a transmission over 90%, metaphosphate structure of glass together with Q^2 boron oxide units and P-O-B bonds. The mechanical parameters, hardness (H), Young's Modulus (E) and fracture toughness (K_{IC}) of boron phosphate glasses,