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FTIR SPECTROSCOPY STUDY ON TELLURITE DOPED Eu_2O_3 GLASS

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ABSTRACT

A series of tellurite glass based on TeO_2-ZnO-$ZnCl_2$-Li_2O-Eu_2O_3 were successfully prepared by the melt-quenching technique. Fourier Transform Infrared (FTIR) studies for each sample has been carried out in the range of 400 – 4000 cm^{-1}. Differential Thermal Analysis (DTA) shows that the incorporation of Li_2O increased the stability of the tellurite glass. FTIR spectra showed a large absorption peak between 650 – 680 cm^{-1} which corresponds to the TeO_4 stretching vibration mode. However, the peak shifted towards a higher wave number as the Li_2O was increased. The peak between 730 – 770 cm^{-1} which corresponds to the TeO_3 stretching vibration mode. However, the peaks at 3400cm^{-1} and between 1620 – 1650 cm^{-1} correspond to H-OH and M-OH stretching vibration respectively. It was also observed that the glass with high Li_2O content has a high transmission intensity.

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REFERENCES

[1] Nahu, H., Uchigaki, T., Kamiya, K., Kanbara, H. and Kubodera, K.; Jpn. J. Appl. Physics. 31, (1992) 3899.
[2] Wang, J. S., Vogel, E. M. and Snitzer, E.; Opt. Maters. (1994) 187.
[3] Kim, S. H. and Yoko, T.; J. Am. Ceramic. Soc 78(4), (1995) 1061.
[4] Özen, G., Denis, J. P., Genotelle, M. and Pelle, F.; J. Physics Condens. Matter 7, (1995) 4325.
[5] Shih, P. Y., Yung, S. W. and Chin, T. S.; J. Non-Cryst Solids. 224, (1998) 143.
[6] Ovecogln, M.L.; J. Euro. Ceramic. Soc. 18, (1998) 161.
[7] Tastumisago, M., Minami, T., Kowada, Y. and Adachi, H.; Phys. Chem. Glasses. 35 (1994) 89.
[8] El- Mallawamy, R.; Infrared Phys. 29(2-4), (1989) 781.
[9] El-Zaidia, M. M., Ammar, A. A. and El-Mallawamy, R.; Phys. Stat. Sol (a). 91, (1985) 637.
[10] Sahar, M.R. and Noordin, N.; J. Non-Cryst. Solids. 184 (1995) 137.
[11] Sekiya, T., Mochida, N., Ohtsuka, A. and Tonokawa,; J. Non-Cryst. Solids. 144 (1992) 128.
[12] Sekiya, T., Mochida, N., Ohtsuka, A. and Tonokawa,; J. Non-Cryst. Solids 124 (1990) 275.
[13] Hu, L. and Jiang, Z.; Phys. Chem. Glasses. 37(1) (1996) 19.