# テルライトガラスに関するボソンピーク及び構造変化との相関関係の研究

# Study of the Boson peak and correlation to structural variations in Tellurite glasses

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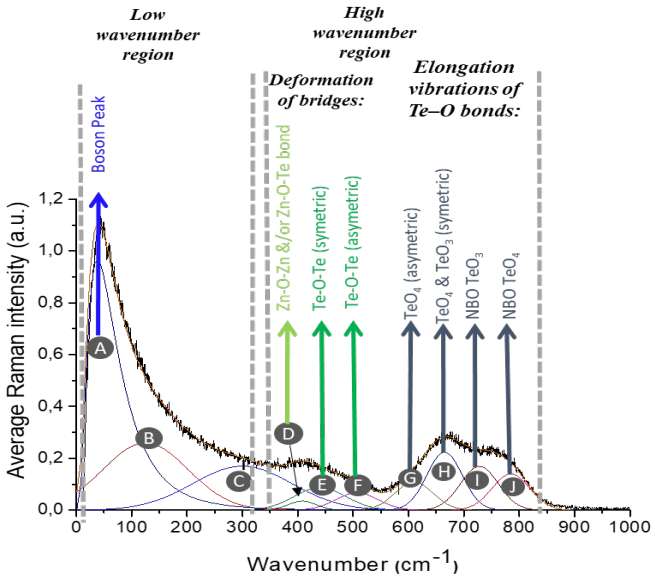
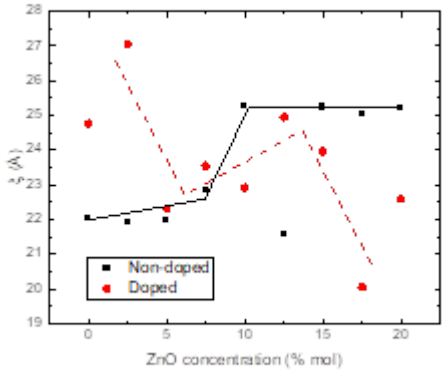
Tellurium oxide-based glasses have a lot of interests due to their specific physical and chemical properties such as high refractive index, wide band infrared transmittance and large third order non-linear optical susceptibility [1].

This work will focus on $80TeO_2$-xZnO-(20-x) $Na_2O$ (TZN) ternary glassy system doped with $Nd^{3+}$ ion and without doping. Addition of ZnO and $Na_2O$ is known to improve the stability of tellurite glasses while preserving high optical properties [2]. In this poster presentation, Structural properties were investigated with Raman and XAFS at the Zinc threshold experiment. In this study, a detailed research on the Boson peak, which is an excess of vibrational density of states found in Raman spectroscopy at around 1THz (33.3 $cm^{-1}$).




The Boson peak is associated with different models: *(i)* The dispersion of acoustic phonons in a disordered medium by polarizability; *(ii)* The fluctuation of the intrinsic densities; *(iii)* The vibrations of small, structured clusters inside the glass; *(iv)* The vibrations of localized clusters inside the glass showing elastic fluctuations. Some authors [3] have connected the Boson peak to the medium distance order inside the glass, with a study on the correlation length, here named as the blob size, performed from its evolution and the evolution of the mechanical properties.

This oral presentation will correlate the evolution of the Blob size and the results from XAFS experiment to show the influence of $Nd^{3+}$ ions doping on the TZN network, which shows a total difference in evolution with an increase of the ZnO concentration (overall decrease of the blob size when doped compared to an increase when non-doped).




References

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