Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

The Sb_2O_3 redox route to obtain copper nanoparticles in glasses with plasmonic properties†

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Supplementary Information

Figure 1 shows micrography from $0.1NaPO_3$-$0.8Sb_2O_3$-0.1CuO glass obtained by High-angle annular dark-field imaging – Scanning Transmission Electron Microscopy (HAADF-STEM) from a FEI-Titan TEM Microscope. The sample was prepared using Focused Ion Beam (FIB) with Ga^{3+} ion using a FEI-QUANTA 3D dual beam SEM/FIB. One can be seen nanostructures with dimensions around 2-3 nm. However, such features cannot be definitively ascribed to the copper nanoparticles since gallium beam may be interfering on the surface structure at this dimension, and ^{29}Cu, ^{31}Ga, and ^{51}Sb have relative difficult to be contrasted in the electron microscopy techniques.

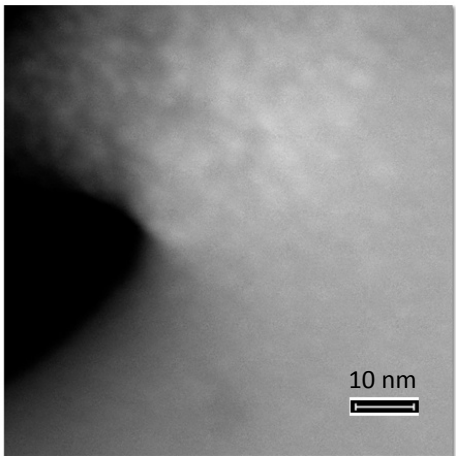

Figure 1: Transmission Electron Microscopy Image of the $0.1NaPO_3$-$0.8Sb_2O_3$-0.1CuO glass.

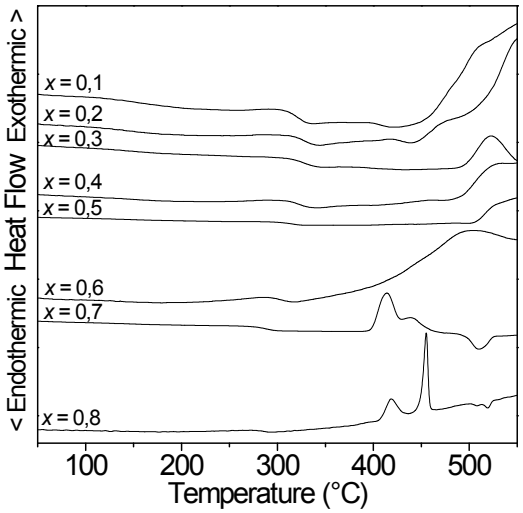

Figure 2: DSC curves of the $(0.9\text{-}x)NaPO_3$-xSb_2O_3-0.1CuO glasses.

Figure 2 shows DSC curves for $(0.9\text{-}x)NaPO_3$-xSb_2O_3-0.1CuO glasses. Thermal analyses for all samples were performed using a Schimadzu DSC60 calorimeter with a programmed heating rate of 10°Cmin^{-1} up to 550°C, under N_2 atmosphere, in aluminium crucibles.