Effect of Sb and Cu on Optical and Magneto optical properties of 
$20SiO_2 - 20B_2O_3 - (60 - x)Sb_2O_3 - xCuO$ glass system

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Magneto-optical rotation was measured at room temperature for diamagnetic glasses of $20SiO_2 - 20B_2O_3 - (60 - x)Sb_2O_3 - xCuO$ composition with $x=1.0; 1.5; 2.0; 2.5; 3.0; 3.5$ and $4.0$ molar percentage respectively. We use the HeNe laser beam at 632.8 nm and magneto-optical rotation was measured at room temperature by modulated ac magnetic field of 50 at 300 Oesterd. The glasses are found with high refractive index and high optical dispersion obtained by adding high atomic weight such as $Sb_2O_3$ and presence of $Cu$ nanoparticles. The optical characterization is performed using transmittance and specular reflectance measures in Uv-Vis region; the refractive index dispersion and other parameters as optical band gap, optical polarizability and molar refraction were determined. The glasses were submitted to thermal treatment above the glass transition temperature ($T_g\sim 400^\circ C$) at 1.0, 2.0, 3.0, 4.0, 5.0, 7.0, 9.0 and 11.0 hours, in this process, the co-oxidation and reduction of the copper and antimony ions can occur. We observed the copper nanoparticles have the effect of strong quantum confinement with the absorption bands in the region of 450 nm to 600 nm and by photoluminescence. The absorption bands of Cu nano crystals is observed in the UV-Vis measures these measures indicates the transformation process of different glasses keeping the transparence. The IR absorption bands indicates variations between $1700cm^{-1}$ up to $500cm^{-1}$. The results of thermal treatment are studied and discussed through measuring FTIR, Uv-vis and magneto optical measurements.