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Photoelectron spectra of $GexSb_{20}Se_{80-x}$ glasses**Wang Li and Xu Si-Wei**
Beijing University of Technology, China

Several $GexSb_{20}Se_{80-x}$ glasses are prepared ($x=5, 10, 15, 17.5, 20$ and 25 mol%), and measured their Raman and X-ray photoelectron spectra (Ge 3d, Sb 4d and Se 3d) in order to understand the evolution of the glass structure as a function of chemical composition. We further decomposed the spectra into different structural units following the assignments of these structural units in the previous literature. It was found that, Se-Se-Se trimers structural units exists in the Se-rich glasses, but the number of the trimers structural units decreases rapidly with increasing Ge concentration and finally becomes zero in $Ge_{15}Sb_{20}Se_{65}$ glass. With increasing Ge concentration, the amount of $GeSe_{4/2}$ tetrahedral structure increases and that of $SbSe_{3/2}$ pyramidal structure remains almost no changes in the Se-rich glasses. On the other hand, the number of Ge-Ge and Sb-Sb homopolar bonds increases with increasing Ge concentration, and that of the $GeSe_{4/2}$ tetrahedral and $SbSe_{3/2}$ pyramidal structures decrease in the Se-poor glasses. Moreover, the Se-Se homopolar bonds exist in all the glasses, and they cannot be completely suppressed. When the composition is close to chemical stoichiometry, the glass is dominated by heteropolar Ge-Se and Sb-Se bonds with negligible amount of Ge-Ge, Sb-Sb and Se-Se homopolar bonds. The transition threshold occurred at the chemically stoichiometric glasses rather than the transition predicted by the topological constraint model suggested that, chemical order rather than topological order is a main factor in determining structure and physical properties of Ge-Sb-Se glasses.

Biography

Wang Li is a Professor at the Beijing University of Technology, China. She has her expertise in novel laser with all solid state and nonlinear optics, nanomaterials and technology in improving the optical materials and laser. She has published 130 papers in international journals and conferences of these areas. She is now a member of the SPIE, OSA and the Optical Society of China.

Lwang.1@bjut.edu.cn

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