

In the present study, ternary Bi-Ge-In and Bi-Ge-Sn systems were experimentally investigated using differential thermal analysis (DTA), scanning electron microscopy with energy dispersive spectroscopy (SEM–EDS) and x-ray diffraction. The results of experimental investigation were compared with thermodynamically predicted phase diagrams. Temperatures of phase transformations, determined by DTA, were compared with the calculated vertical sections (three vertical sections per ternary systems were investigated) and a close agreement was obtained. The results of EDS analysis were compared with the calculated isothermal sections. Phase compositions of co-existing phases, determined by EDS analysis, were found to support the corresponding calculated phase compositions quite well. Based on the observed overall good agreement between the results of experiments and thermodynamic calculations, it was concluded that fairly accurate descriptions of the phase diagrams of ternary Bi-Ge-In and Bi-Ge-Sn systems can be obtained without the introduction of ternary thermodynamic parameters. By using the proposed thermodynamic datasets, liquidus projections and invariant reactions have been predicted for both the investigated ternary systems.