

The ternary Ge-In-Zn system is chosen for the study due to the importance of germanium-based alloys in the industry of electronic devices and their special application as memory materials. This ternary system has not been explored so far. In the current work, experimental techniques such as differential thermal analysis (DTA), scanning electron microscopy (SEM) with energy dispersive spectrometry (EDS), X-ray powder diffraction (XRD) and electrical conductivity tests were used for characterization of the prepared ternary Ge-In-Zn alloys. Investigated alloys were from four isothermal sections at 25, 100, 200 and 300 °C and three vertical sections Ge-InZn, In-GeZn, Zn-GeIn. The obtained results were compared with the results of thermodynamic calculation of phase equilibria based on the Calphad method. The calculation was performed by using thermodynamic parameters for constitutive binary systems. Good agreements between calculated phase diagrams and experimental data have been obtained without introducing ternary thermodynamic parameters. Based on that, calculations of liquidus projection and invariant reactions were performed.