

Thermodynamic calculation of equilibrium compositions of phases at the hydrochemical production of high-purity thallium halides for IR-ray fiber optics

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Abstract

The investigated objects represent as heterogeneous systems solid – liquid with brutto-component composition H₂O-HX-TlX (X – or Cl, or Br), using in the hydrochemical synthesis of the highpure solid TlX for IR optics. The methodology for the thermodynamic analysis of the equilibrium component compositions of the liquid phases in these systems was developed and realized. It is based on the laws of the phase and chemical equilibriums and requires the using of the handbook data, concerned the equilibrium characteristics of mass-transfer processes between solid and liquid phases and chemical reactions in the liquid phase, as well as the activity coefficients of the liquid-phase components. The reliability of the thermodynamic calculations was confirmed by the experimental data on the solubility of the solid TlX in liquid media.