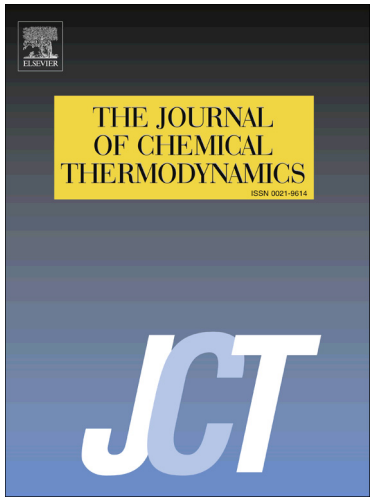

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Determination of the thermodynamic properties of the $Ag_2CdSn_3S_8$ and Ag_2CdSnS_4 phases in the Ag–Cd–Sn–S system by the solid-state electrochemical cell method

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ABSTRACT

Triangulation of the quaternary Ag–Cd–Sn–S system in the Ag_2SnS_3–SnS–Sn_2S_3–CdS part below T = 600 K was performed using X-ray diffraction method. The spatial position of the determined four-phase regions regarding the figurative point of silver was used to write forming chemical reactions. The forming reactions were performed by applying electrochemical cells (ECCs): (–) C | Ag | Ag_2GeS_3 glass | $Ag_2CdSn_3S_8$, SnS, Sn_2S_3, CdS | C (+) and (–) C | Ag | Ag_2GeS_3 glass | Ag_2CdSnS_4, SnS, $Ag_2CdSn_3S_8$, CdS | C (+), where C is graphite and Ag_2GeS_3 glass is the fast purely Ag^+ ions conducting electrolyte. The linear dependencies of the EMF of the ECCs on temperature in the range T = (462–500) K were used to calculate the standard thermodynamic values of the $Ag_2CdSn_3S_8$ and Ag_2CdSnS_4 phases for the first time.

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