

## TEMPERATURE DEPENDENCE OF THE HEAT CAPACITIES OF NEW OXOCOMPOUNDS OF TELLURIUM

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The thermodynamic data of new tellurium oxocompounds is necessary for determining the direction of the reaction flow in systems, determination of the values of equilibrium constants and modeling the synthesis of new substances, as well as for the determination of energy and the nature of the chemical bond.

The purpose of this work is to investigate the temperature dependence of the heat capacities of new oxocompounds of tellurium. Double gadolinium tellurites  $\text{GdMe}^{\text{II}}\text{TeO}_{4.5}$  ( $\text{Me}^{\text{II}} - \text{Ca, Sr, Ba}$ ) were synthesized by the ceramic technology from gadolinium (III), tellurium (IV) oxides and alkaline earth metal carbonates. The formation of the equilibrium composition of the compounds was monitored by X-ray diffraction analysis using DRON-2.0 device.

The heat capacity of new gadolinium tellurites has been investigated by the Landiya method in the temperature range of 298–900 K. Landiya proposed a scheme for calculating the isobaric heat capacity of crystalline inorganic substances.

Below there is given the example of calculation results for  $\text{GdCaTeO}_{4.5}$ . The standard entropy ionic increments by the method of Kumok's:  $S^{\circ}(298.15) = 181.25 \text{ J}/(\text{mol}\cdot\text{K})$ . The values of the heat capacity of the compound at various temperatures are calculated with the Landiya formulas. Based on the following data:

T, K	298.15	673	900
$C_p^{\circ}$ , J/(mol·K)	36.30	46.99	53.19

the equation of the temperature dependence of the heat capacity  $\text{GdCaTeO}_{4.5}$  in the temperature range of 298.15 - 900 K is derived:

$$C_p = 28.6332 + 27.3412 \cdot 10^{-3} \cdot T - 4.294 \cdot 10^{-4} \cdot T^2$$

Due to calculated data there was made the linear dependence  $C_p^{\circ} \sim f(T)$  chart in the temperature range of 298.15–900 K. Thus, in the temperature range of 298.15 to 900 K, for the first time the temperature dependences of the heat capacities of new double gadolinium tellurites were determined by the method of Landiya. The results of the research may be of interest for the directed synthesis of chalcogenites with given properties.