

# Untersuchungen zum ternären System Bi/Te/O, III.

## Bestimmung thermodynamischer Daten der ternären Verbindungen

Investigations on the Ternary System Bi/Te/O, III.

Determination of Thermodynamic Data of Ternary Compounds

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Bismuth-Tellurium-Oxides, Heat of Solution, Enthalpy of Formation

The phase relations in the ternary system Bi/Te/O have been determined in previous studies by solid state reactions. Thermodynamical data have now been obtained for the pertinent equilibria. The heats of solution of  $\text{Bi}_2\text{O}_3$ ,  $\text{Bi}_{12}\text{TeO}_{20}$ ,  $\text{Bi}_{10}\text{Te}_2\text{O}_{19}$ ,  $\text{Bi}_{16}\text{Te}_5\text{O}_{34}$ ,  $\text{Bi}_2\text{TeO}_5$ ,  $\text{Bi}_2\text{Te}_2\text{O}_7$ ,  $\text{Bi}_2\text{Te}_4\text{O}_{11}$  and  $\text{TeCl}_4$  were determined in 4N HCl. From these the enthalpies of formation of bismuth tellurites at 298 K have been derived:

$$\Delta H_{\text{B}}^{\circ}(\text{Bi}_{12}\text{TeO}_{20}, \text{f}, 298) = -901,6 \pm 8 \text{ kcal/mol},$$

$$\Delta H_{\text{B}}^{\circ}(\text{Bi}_{10}\text{Te}_2\text{O}_{19}, \text{f}, 298) = -856,1 \pm 9 \text{ kcal/mol},$$

$$\Delta H_{\text{B}}^{\circ}(\text{Bi}_{16}\text{Te}_5\text{O}_{34}, \text{f}, 298) = -1519,5 \pm 17 \text{ kcal/mol},$$

$$\Delta H_{\text{B}}^{\circ}(\text{Bi}_2\text{TeO}_5, \text{f}, 298) = -222,8 \pm 3 \text{ kcal/mol},$$

$$\Delta H_{\text{B}}^{\circ}(\text{Bi}_2\text{Te}_2\text{O}_7, \text{f}, 298) = -299,4 \pm 4 \text{ kcal/mol},$$

$$\Delta H_{\text{B}}^{\circ}(\text{Bi}_2\text{Te}_4\text{O}_{11}, \text{f}, 298) = -448,2 \pm 7 \text{ kcal/mol}.$$

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