

# Untersuchungen zum quasibinären System $\text{Bi}_2\text{Te}_3/\text{BiCl}_3$

Investigations on the Pseudobinary System  $\text{Bi}_2\text{Te}_3/\text{BiCl}_3$

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Z. Naturforsch. **54 b**, 234–238 (1999); eingegangen am 9. Oktober 1998

Bismuth Telluride Chloride, Phase Diagram, Total Pressure Measurements, Calorimetry,  
Thermodynamic Data

The phase diagram of the pseudobinary system  $\text{Bi}_2\text{Te}_3/\text{BiCl}_3$  was investigated by DTA, total pressure measurements, and X-ray phase analysis. Only  $\text{BiTeCl}$  exists as a ternary phase in this system. The compound melts incongruently at  $430\text{ }^\circ\text{C}$ . The heat of formation and the standard entropy of  $\text{BiTeCl}$  were calculated from vapor pressure data:

$\Delta H_{\text{B}}^\circ (\text{BiTeCl}, \text{f}, 298) = (-39,5 \pm 1,6) \text{ kcal/mol}$ ;  $S^\circ (\text{BiTeCl}, \text{f}, 298) = (34,4 \pm 2,7) \text{ cal/K}\cdot\text{mol}$ .

The heat of formation of  $\text{BiCl}_3$  was determined on the basis of the heat of solution of  $\text{BiCl}_3$  and  $\text{Bi}_2\text{O}_3$ , and the heat of formation of  $\text{Bi}_2\text{O}_3$ :  $\Delta H_{\text{B}}^\circ (\text{BiCl}_3, \text{f}, 298) = (-95,9 \pm 0,9) \text{ kcal/mol}$ .

\* Sonderdruckanforderungen an Prof. Dr. H. Oppermann.