

Thermische Zersetzung und Lösungskalorimetrie von Ammoniumneodymbromiden

Thermal Decomposition and Solution Calorimetry of Ammonium Neodymium Bromides

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Z. Naturforsch. **54 b**, 1283–1294 (1999); eingegangen am 22. Juli 1999

Ammonium Neodymium Bromides, Neodymium Bromide, Thermal Decomposition, Standard Enthalpy of Formation, Standard Entropy

The thermal decomposition equilibria of ammonium neodymium bromides $(\text{NH}_4)_3\text{NdBr}_6$, $(\text{NH}_4)_2\text{NdBr}_5$ and $\text{NH}_4\text{Nd}_2\text{Br}_7$ have been investigated by total pressure measurements. The thermodynamical data of these solid phase complexes have been derived from the decomposition functions. The standard enthalpies of solution in 4N HBr (aq.) of $(\text{NH}_4)_3\text{NdBr}_6$, $(\text{NH}_4)_2\text{NdBr}_5$, $\text{NH}_4\text{Nd}_2\text{Br}_7$, NdBr_3 and Nd_2O_3 were measured. On the basis of these values and tabulated data, the standard enthalpies at 298 K of the ammonium neodymium bromides were derived and compared with the results obtained from the total pressure measurements.

Data by total pressure measurement: $\Delta H_{\text{B}}^{\circ}((\text{NH}_4)_3\text{NdBr}_{6,\text{f},298}) = -399,1 \pm 4,9$ kcal/mol; $S^{\circ}((\text{NH}_4)_3\text{NdBr}_{6,\text{f},298}) = 153,4 \pm 7,4$ cal/K·mol; $\Delta H_{\text{B}}^{\circ}((\text{NH}_4)_2\text{NdBr}_{5,\text{f},298}) = -343,0 \pm 4,4$ kcal/mol; $S^{\circ}((\text{NH}_4)_2\text{NdBr}_{5,\text{f},298}) = 109,9 \pm 6,8$ cal/K·mol; $\Delta H_{\text{B}}^{\circ}(\text{NH}_4\text{Nd}_2\text{Br}_{7,\text{f},298}) = -484,0 \pm 5,1$ kcal/mol; $S^{\circ}(\text{NH}_4\text{Nd}_2\text{Br}_{7,\text{f},298}) = 127,9 \pm 6,6$ cal/K·mol.

Data by solution calorimetry: $\Delta H_{\text{B}}^{\circ}(\text{NdBr}_{3,\text{f},298}) = -208,7 \pm 1,6$ kcal/mol; $\Delta H_{\text{B}}^{\circ}((\text{NH}_4)_3\text{NdBr}_{6,\text{f},298}) = -404,8 \pm 2,7$ kcal/mol; $\Delta H_{\text{B}}^{\circ}((\text{NH}_4)_2\text{NdBr}_{5,\text{f},298}) = -344,2 \pm 2,4$ kcal/mol; $\Delta H_{\text{B}}^{\circ}(\text{NH}_4\text{Nd}_2\text{Br}_{7,\text{f},298}) = -482,7 \pm 3,7$ kcal/mol.