

Thermische Zersetzung und Lösungskalorimetrie von Ammoniumneodymchloriden

Thermal Decomposition and Solution Calorimetry of Ammonium Neodymium Chlorides

C. Hennig, H. Oppermann*

Institut für Anorganische Chemie der Technischen Universität,
MommSENstraße 13, D-01069 Dresden

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The thermodynamical data of ammonium neodymium chlorides $(\text{NH}_4)_2\text{NdCl}_5$ and $\text{NH}_4\text{Nd}_2\text{Cl}_7$ were derived by the determination of their decomposition equilibria by total pressure measurements. Moreover, solution calorimetry was applied. The enthalpies of formation of these phases were calculated from their heats of solution and from the enthalpies of formation and the heats of solution of NdCl_3 and NH_4Cl .

Data by total pressure measurement:

$$\Delta H_{\text{B}}^{\circ}((\text{NH}_4)_2\text{NdCl}_{5,\text{f},298}) = -412,5 \pm 3,6 \text{ kcal/mol};$$

$$S^{\circ}((\text{NH}_4)_2\text{NdCl}_{5,\text{f},298}) = 80,1 \pm 5,8 \text{ cal/K}\cdot\text{mol};$$

$$\Delta H_{\text{B}}^{\circ}(\text{NH}_4\text{Nd}_2\text{Cl}_{7,\text{f},298}) = -579,5 \pm 3,5 \text{ kcal/mol};$$

$$S^{\circ}(\text{NH}_4\text{Nd}_2\text{Cl}_{7,\text{f},298}) = 101,8 \pm 5,6 \text{ cal/K}\cdot\text{mol}.$$

Data by solution calorimetry:

$$\Delta H_{\text{B}}^{\circ}(\text{NdCl}_{3,\text{f},298}) = -251,2 \pm 0,7 \text{ kcal/mol};$$

$$\Delta H_{\text{B}}^{\circ}((\text{NH}_4)_2\text{NdCl}_{5,\text{f},298}) = -405,5 \pm 1,0 \text{ kcal/mol};$$

$$\Delta H_{\text{B}}^{\circ}(\text{NH}_4\text{Nd}_2\text{Cl}_{7,\text{f},298}) = -576,8 \pm 1,7 \text{ kcal/mol}.$$

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