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Measurement of the Enthalpy and Free Energy of GaN[1] TIMOTHY J. PESHEK, KATHLEEN KASH, Physics Department, Case Western Reserve University, JOHN C. ANGUS, Chemical Engineering Department, Case Western Reserve University — Direct measurement of the thermochemical properties of GaN has proven difficult, and differences in reported values remain. We present a technique for direct measurement of the free energy of formation of GaN by finding the partial pressures of ammonia gas in hydrogen for spontaneous formation and elimination of a GaN film on a liquid Ga surface in the temperature range 750-1050 C. These data were used to calculate the enthalpy of formation of GaN. The measured values are compared to those obtained by other means, e.g. calorimetry or direct reaction of N_2 and molten Ga.

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