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Experimental Determination of the Heats of Formation for the Ordered Intermetallics in the Fe-Pt System DAVID BERRY, KATAYUN BARMAK, Carnegie Mellon University, YSELA CHIARI, The Florida State University — Accurate heats of formation are necessary to examine phase stability and to aid in the modeling of phase transitions. However, most reported heats of formation, particularly for intermetallic compounds, are available only as the result of theoretical calculations with little or no experimental verification. For the Fe-Pt system, in which a phase transition from the disordered A1 phase to the ordered L1₀ phase is of great current interest for application in ultrahigh density magnetic recording media, only a few sets of calculated heats of formation are available, for which there is sizable disagreement. Using non-isothermal differential scanning calorimetry (DSC) of sputter-deposited multilayer thin films, the heats of formation of the ordered intermetallic phases, namely L1₂ Fe₃Pt and FePt₃, and L1₀ FePt, are measured. These values are then compared with the first principles calculated values available in the literature, where there is good qualitative agreement; however, all of the calculated values have underestimated the total heats of formation.

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