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Thermodynamic considerations in the synthesis of complex metal hydrides via mechanicosynthetic techniques ASHLEY C. STOWE, POLLY A. BERSETH, ARTHUR JURGENSEN, DONALD ANTON, RAGAIY ZIDAN, Savannah River National Laboratory — Complex metal hydrides have been synthesized for hydrogen storage through a new synthetic technique utilizing high hydrogen overpressure at elevated temperatures (molten state processing). This synthesis technique holds the potential of fusing different known complex hydrides at elevated temperatures and pressures to form new species with enhanced hydrogen storage properties. Formation of these compounds is driven by thermodynamic and kinetic considerations. Novel synthetic complexes were structurally characterized and there hydrogen desorption properties were investigated. The effectiveness of the molten state process will be compared with mechanicosynthetic ball milling.

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