

Dynamic Data Evaluation Evolution for the Metallic Systems

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The concept of dynamic data evaluation has been employed in the Thermodynamics Research Center (TRC) at within NIST to develop a database of critically evaluated thermodynamic property data for the organic, predominantly liquid and gaseous, phase systems. NIST additionally develops the tools used for data collection and analysis, both prior to addition to the database as well as data curation. The vigilant maintenance of the data quality in the SOURCE database has proven to many industrial sponsors the value of a dynamically evaluated database. An expansion of the focus of TRC into the fields of metallurgical systems began in early 2013 as a part of the Materials Genome Initiative, a multi-agency effort designed to create a materials innovation infrastructure that includes: computational and experimental tools, digital data and collaborative networks in the materials community. It is the goal of the TRC to provide dynamic, modern, thermodynamic data—however this requires the development of a both a data structure and that ability to communicate between different platforms. The first effort for TRC was to develop both a data structure and software for data capture. Differences arise in the structure due to the presence of multiple phases in the solid state, compared to TRC's traditional organic system consisting of phases that are classified as condensed liquids. The presentation will discuss the challenges in metallurgical thermodynamic data and developed solutions that allow TRC to capture the data.