EVALUATION OF CO-BASED THERMODYNAMIC DATABASES WITH RESPECT TO OWN AND LITERATURE EXPERIMENTAL DATA

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The development of Ni-based alloys proved the importance of dedicated Gibbs energies databases constructed following the CALPHAD method. Validated databases for Co-based and Ni/Co-based alloys are therefore imperative. These databases are being constructed concurrently with the development of new alloys in an interactive mode: databases anticipate quantities, new measurements are done which validate the database results or demand for changes.

In this work we collect several thermodynamic assessments of ternaries and quaternaries systems, relevant for Co-based alloys, published recently in the literature and compare the calculated results with the obtained by using TCNI8 (which can also be used for Co-based alloys). We also compare calculated results to Liquidus and solidus temperatures experimentally determinate for several alloys in development in Erlangen. A comparison between First Principles calculated formation enthalpies of several TCP (topologically close packed) phases with the values calculated from the databases is also presented.

As a result of this analysis necessary changes in the databases are pointed out as well as the regions of composition and temperature where more experimental data is required.