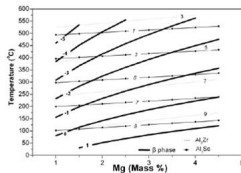


Thermodynamics for Alloy Design is a relatively new methodology for alloy development. This new methodology makes use of the powerful tools of computational alloy thermodynamics in order to quantify the effects of alloying elements on critical microstructural elements which directly influence the properties of the material. These elements include formation of solid solutions and intermetallic compounds, grain refinement, recrystallization resistance, precipitation strengthening and more. With this method multi-element alloy systems can be simulated. The simulations are based on the CALPHAD method for the description of the Gibbs free energies of the various phases in a given system. The calculations are performed, at LoM, with the Thermo-Calc software system and relevant thermochemical databanks.



Precipitation driving force maps for MRX index

In the attachment below, an example of alloy design is given for the 5xxx series Al-Mg alloys with Zr and Sc additions.