

Thermodynamic modelling of Physical Vapor Deposition

M. to Baben, K. Hack

GTT-Technologies, Herzogenrath, Germany

During physical vapor deposition, a metallic target material is evaporated and the metal vapor is transported to the substrate where it condenses and forms the thin film. This processing route results in extreme quenching rates that can be estimated as high as 10^{15} K/s and thin films are often deposited in structures far away from thermodynamic equilibrium phases. Nevertheless, it is shown here that thermodynamic modelling can be used for process modelling of physical vapor deposition, describing the metal vapor generation or predicting non-equilibrium phase formation using the paraequilibrium option.