The Application of ChemApp in Steelmaking Process Models

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Abstract

When attempting to dynamically model batch metallurgical processes, the assumption of the presence of 'global' thermodynamic equilibrium between the phases present is not necessarily valid. An alternative approach is to define the final chemical equilibrium within the system as a combination of the dynamic approach to 'local' equilibrium. This can be accomplished by linking computational software describing the mass flow within the system to thermodynamic code describing the phase distribution.

The coupling of ChemApp to the computational fluid dynamics code CFX has been achieved in order to model the filling of a ladle on tapping from the B.O.S vessel. A similar methodology has been applied to investigate treatment of steel in an RH degasser. Modelling of Ladle Arc Furnace (LAF) treatment by the integration of ChemApp with the software package Aspen Custom Modeller (ACM) has also been accomplished.