

Modeling of Argon Process Refining Based on Equilibrium State Analysis of Metal Bath - Slag Reactions and Tank Model Theory

P. Drozd

Department of Ferrous Metallurgy
Faculty of Metals Engineering and Industrial Computer Science
AGH University of Science and Technology, Poland

Abstract

The homogenization of chemical composition and metal bath temperature is occurred by the argon steel refining at the ladle and connected with obtaining equilibrium states. Simultaneously take place the floating process of non-metallic inclusions and their removal from metal bath. The great influence on the course of these processes have the chemical composition of ladle slag, methods and intensity of argon blow. A new concept of modeling the changes of metal and slag chemical composition has been elaborated. The tank theory connected with thermodynamic model of the interfacial metal bath-slag reactions has been used to develop hybrid model of process. The results of the model have been verified using an industrial database. Application of the tank theory to describe the stirring of metal bath make possible the simulation of process in real time.