Erratum to: A Mathematical Modeling Study of Tracer Mixing in a Continuous Casting Tundish

CHAO CHEN, LAGE TORD INGEMAR JONSSON, ANDERS TILLIANDER,
GUO GUANG CHENG, and PÄR GÖRAN JÖNSSON

DOI: 10.1007/s11663-015-0448-1

© The Minerals, Metals & Materials Society and ASM International 2015

**Erratum to: METALLURGICAL AND MATERIALS
TRANSACTIONS B, vol. 46B,
2015, pp. 169–190
DOI: 10.1007/s11663-014-0190-0**

FIRST, Eqs. [7] and [8] are corrected as follows:

$$\frac{\partial}{\partial t}(\rho c_W) + \frac{\partial}{\partial x_i}(\rho \mathbf{u}_i c_W) = \frac{\partial}{\partial x_i} \left(\rho D_{\text{eff}} \frac{\partial c_W}{\partial x_i} \right) \quad [7]$$

$$\frac{\partial}{\partial t}(\rho c_T) + \frac{\partial}{\partial x_i}(\rho \mathbf{u}_i c_T) = \frac{\partial}{\partial x_i} \left(\rho D_{\text{eff}} \frac{\partial c_T}{\partial x_i} \right) \quad [8]$$

Equation [13] is corrected as follows:

$$\frac{\partial}{\partial t}(\rho c_1) + \frac{\partial}{\partial x_i}(\rho \mathbf{u}_i c_1) = \frac{\partial}{\partial x_i} \left(\rho D_{\text{eff}} \frac{\partial c_1}{\partial x_i} \right) \quad [13]$$

Specifically, in the transport equations for the mass fraction of water, tracer, and the scalar (Eqs. [7], [8], and [13], respectively). The density properties were the density of the mixture in Eq. [10] instead of the density of the water or the tracer itself.

Second, the update of one of the result in the article. Regarding the result (1) KCl density only (OD) in

Table II and the text in p. 179: “Apart from the KCl molecule diffusion, the mesh difference could also, to some extent, influence the differences in the results.” The result (1) KCl density only (OD) was based on a mesh of $168 \times 71 \times 70$ grids, while the other results (2) through (5) were based on a mesh of $193 \times 79 \times 117$ grids. A new simulation for the (1) KCl density only (OD) were recently made based on a mesh of $193 \times 79 \times 117$ grids to maintain the consistency. It was difficult to distinguish the difference between the RTD curves of the case that implemented with density only (OD) and the case implemented with both density and KCl molecule diffusion (KMD).

To conclude, all the properties of tracer (except for the density) that implemented in the CFD model could not affect the calculated RTD curves.

ACKNOWLEDGMENTS

Dr. Michael R. Malin of CHAM Limited is acknowledged for pointing out the mistakes as described in the first part of this erratum.

CHAO CHEN, Ph.D. Student, is with the Division of Applied Process Metallurgy, Department of Materials Science and Engineering, KTH-Royal Institute of Technology, Brinellvägen 23, SE-100 44 Stockholm, Sweden, also with the State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing, Beijing 100083, P.R. China and also with Department of Ferrous Metallurgy, School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing. Contact e-mail: cchao@kth.se LAGE TORD INGEMAR JONSSON, Professor, is with the Division of Applied Process Metallurgy, Department of Materials Science and Engineering, KTH-Royal Institute of Technology, and also with the Division of CBRN Defence and Security, FOI, Swedish Defence Research Agency, SE-901 82 Umeå, Sweden. ANDERS TILLIANDER, Docent, and PÄR GÖRAN JÖNSSON, Professor, are with the Division of Applied Process Metallurgy, Department of Materials Science and Engineering, KTH-Royal Institute of Technology GUO GUANG CHENG, Professor, is with the State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing.

The online version of the original article can be found under doi: [10.1007/s11663-014-0190-0](https://doi.org/10.1007/s11663-014-0190-0).

Article published online September 3, 2015.