Discussion

Discussion on: “Interdiffusivities Matrix of CaO-Al₂O₃-SiO₂ Melt at 1723 K to 1823 K”^{*}

JEROEN HEULENS and KAZUHIRO NAGATA

DOI: 10.1007/s11663-011-9587-1

© The Minerals, Metals & Materials Society and ASM International 2011

In their original paper, Sugawara *et al.* published diffusion data for the CaO-Al₂O₃-SiO₂ system. Although their experimental results are not questioned, important errors were detected in the main figure of the article (Figure 8) and in the temperature dependent diffusion coefficients in the abstract. Using the original data from their measurements, the diffusion coefficient expressions and the figure are corrected in this short discussion. K. Nagata is one of the authors of the original work.

In the original version of the article, the pre-exponential factors in the expressions of the abstract on p. 605 are wrong and the equations should read as follows:

$$\tilde{D}_{10-10}^{30} = 3.2 \times 10^{-3} \exp\left(\frac{-253700}{RT}\right) \quad (\text{m}^2 \text{ s}^{-1})$$

$$\tilde{D}_{10-20}^{30} = -1.6 \times 10^{-5} \exp\left(\frac{-194300}{RT}\right) \quad (\text{m}^2 \text{ s}^{-1})$$

$$\tilde{D}_{20-10}^{30} = -7.7 \times 10^{-6} \exp\left(\frac{-177600}{RT}\right) \quad (\text{m}^2 \text{ s}^{-1})$$

$$\tilde{D}_{20-20}^{30} = 0.19 \exp\left(\frac{-318400}{RT}\right) \quad (\text{m}^2 \text{ s}^{-1})$$

JEROEN HEULENS, Research Assistant, is with the Department of Metallurgy and Materials Engineering, Katholieke Universiteit Leuven, 3001 Heverlee, Belgium. Contact e-mail: jeroen.heulens@mtm.kuleuven.be KAZUHIRO NAGATA, Professor, is with the Department of Metallurgical Engineering, Tokyo Institute of Technology, Meguro-ku, Tokyo 152-8552, Japan.

^{*}H. Sugawara, K. Nagata, and K.S. Goto, *Metall. Trans. B*, 1977, vol. 8B, pp. 605–12.

Manuscript submitted September 11, 2011.

Article published online October 4, 2011.

Fig. 1—The relation between reciprocal temperature and the logarithm of the absolute values of the interdiffusivities. This graph is a corrected version of Figure 8 in the original article. The tracer diffusivities of Ca and Si are not shown on this corrected figure.

These equations are obtained by applying linear regression on the data of $\log(D)$ vs $1/T$ relationship for each diffusion coefficient. The data points and regression lines are plotted on Figure 1, which corrects Figure 8 in the original article. Moreover, in the original version of the article, the labeling of Figure 8 on p. 609 is erroneous, and therefore, a new version of this graph is given in Figure 1 with corrected data markers and adequate axis labels.