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Erratum to "Ultra-High Temperature Thermal Conductivity Measurements of a Reactive Magnesium Manganese Oxide Porous Bed Using a Transient Hot Wire Method," ASME J. Heat Transfer, 143(10), p. 104502, DOI: 10.1115/1.4052081

Michael Hayes

Some correlation values in the original work (Ref. 1) were not presented with enough decimal places. These errata update these values and present some revised results. [DOI: 10.1115/1.4062308]

The coefficients listed in Table 2 of Ref. [1] do not feature an adequate number of digits to accurately model material behavior. The correct values are tabulated in Table 1 of this document. Included in these corrections are new coefficients for k_{bed}, which was originally calculated using the truncated values. Figure 3 of the original work must also be updated based on these corrections. These updates are shown in Fig. 1 of this errata.

The experimental data remain accurate, but the representation of the dual porosity model in Fig. 8 of the original work must be updated. Changes to the figure are depicted here in Fig. 2. The model maintains its accuracy in the low-temperature region but overpredicts more severely in the high-temperature region than the originally presented values. The coefficient of determination between the corrected dual porosity model and the experimental data is 0.71. The presented dual porosity model underperforms the method of Yagi and Kunii in predicting effective bed thermal conductivity.

Table 1 Fit coefficients for various thermal conductivities

Property	A	B	C	D	E	F	G
k_{air}	1.470×10^{-11}	-2.996×10^{-8}	7.407×10^{-5}	2.412×10^{-2}			
k_{MgO}	3.29×10^{-18}	-3.2666×10^{-14}	1.2753×10^{-10}	-2.4997×10^{-7}	2.7056×10^{-4}	-0.164	52.849
k_{MnO}	4.1893	-6.734×10^{4}					
k_{bed}	5.94×10^{-10}	-2.08×10^{-7}	5.77×10^{-4}	4.12×10^{-1}			

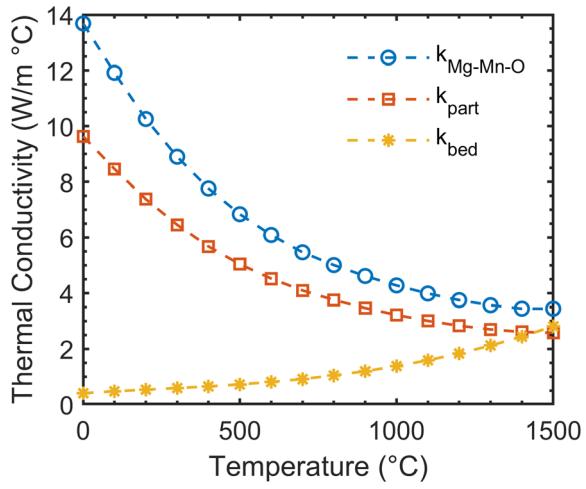

Fig. 1 Mg-Mn-O, particle, and bed thermal conductivities estimated using the dual porosity model

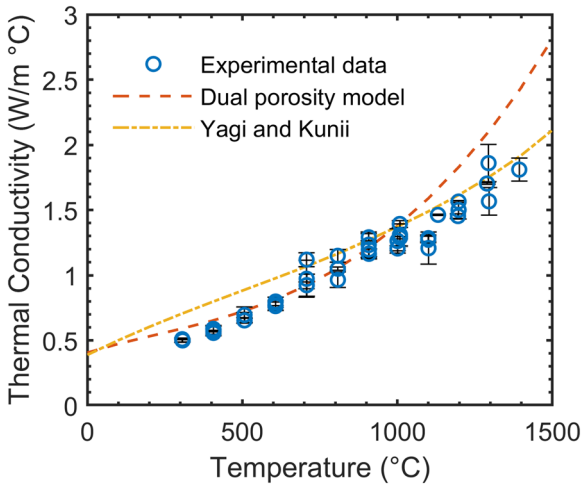

Fig. 2 Experimental data compared to the proposed dual porosity model and the model of Yagi and Kunii

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Nomenclature

k = thermal conductivity, W/m °C

References

[1] Hayes, M., Masoomi, F., Schimmels, P., Randhir, K., Klausner, J., and Petrasch, J., 2021, "Ultra-High Temperature Thermal Conductivity Measurements of a Reactive Magnesium Manganese Oxide Porous Bed Using a Transient Hot Wire Method," ASME J. Heat Mass Transfer-Trans. ASME, **143**(10), p. 104502.