

Correction to Tunable Electrical and Thermal Transport in Ice-Templated Multilayer Graphene Nanocomposites through Freezing Rate Control

[ACS Nano 2013, 7, 11183–11189. DOI: 10.1021/nn404935m]. Scott N. Schiffres, Sivasankaran Harish, Shigeo Maruyama, Junichiro Shiomi, and Jonathan A. Malen*

The effective medium theory (EMT) model of eq 4 in the original article (p 11188) had an error in its implementation that made the thermal boundary conductance used as input greater than stated in the article. The thermal boundary conductance for the plots in Figure 2b and Figure 4 of the original article was $h_{TBC} = 1200 \text{ MW m}^{-2} \text{ K}^{-1}$, instead of $12 \text{ MW m}^{-2} \text{ K}^{-1}$ as stated in the article. Updating the model to use $h_{TBC} = 12 \text{ MW m}^{-2} \text{ K}^{-1}$ has no effect on our experimental results, nor does it change the conclusions of the paper.

The only effect is to offset the EMT model more from experimental data (both ours and data from Sun *et al.* and Zheng *et al.*), as shown in the updated versions of Figure 2b and Figure 4 below. The larger offset in Figure 4 shows that nanoplatelet alignment is not solely responsible for the improved enhancement ratio of solid relative to liquid samples. Other effects, such as hexadecane alignment induced by the presence of the graphitic nanoplatelets, may play a role, as discussed in the original article.

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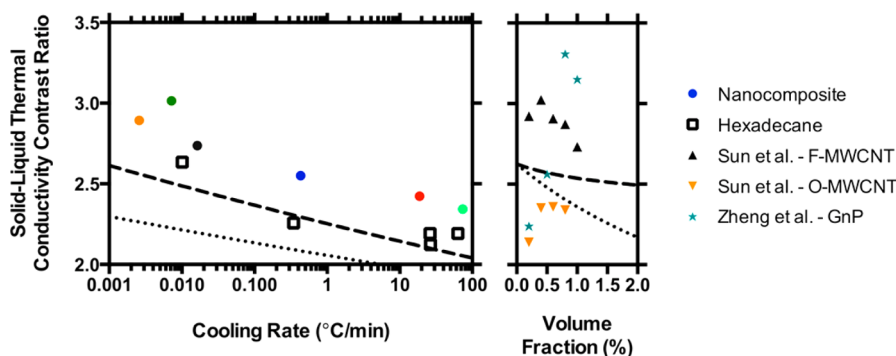


Figure 2b. The solid–liquid thermal conductivity contrast ratios ($k_{\text{Solid}}/k_{\text{Liquid}}$) are plotted versus cooling rate for bulk hexadecane (black squares) and for hexadecane with 1 vol % MLG (circles color coded by cooling rate). The average liquid state thermal conductivity of the liquid nanocomposite and hexadecane are 0.24 and 0.15 W/m-K at 24 °C. The right plot shows the solid–liquid thermal conductivity contrast ratios of Sun *et al.*, and Zheng *et al.* versus vol %. The dashed lines are the Nan *et al.* effective medium predicted contrast ratios for oblate nanoparticles (details are in the Materials and Methods section), with the dashed line of $h_{TBC} = 1200 \text{ MW m}^{-2} \text{ K}^{-1}$ and the dotted line $h_{TBC} = 12 \text{ MW m}^{-2} \text{ K}^{-1}$ for comparison to nanoplatelet data.

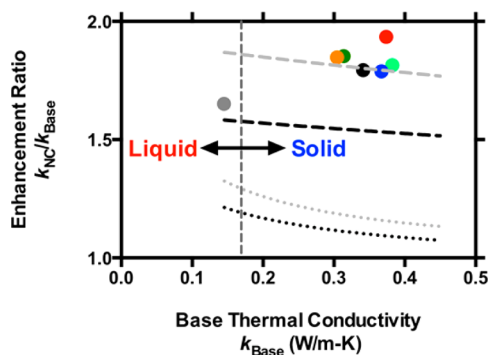


Figure 4. Shows the liquid and solid nanocomposite thermal conductivity enhancements versus base material thermal conductivity. The dashed and dotted lines are effective medium theory predictions of how enhancement should change versus base thermal conductivity. We used the Nan *et al.* model for oblate ellipsoidal nanoparticles with random (gray), fully aligned (black) orientations, with the dashed line of $h_{TBC} = 1200 \text{ MW m}^{-2} \text{ K}^{-1}$ and the dotted line $h_{TBC} = 12 \text{ MW m}^{-2} \text{ K}^{-1}$, with details on the EMT model in Materials and Methods.