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WETTING PHYSICS OF WATER-CARBON NANOCARPET INTERFACES

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SUMMARY: The liquid-solid interface is of critical importance in all convective heat transfer applications but especially at small characteristic length scales. The use of carbon nanotubes (CNTs) has been proposed to amplify energy transfer from liquid to solid, but limited experimental results available have shown mixed results. One reason for the disappointing results is believed to be due to insufficient wetting of the CNTs by the working fluid, most commonly water. Experimental observation of water penetration into a CNT carpet was quantified and compared to simplified theoretical calculations. Conditions necessary for sufficient wetting were noted.