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# Experimental investigation of the heat transfer performance of an oscillating heat pipe with graphene nanofluids

Yu Zhou <sup>a</sup>, Xiaoyu Cui <sup>a,\*</sup>, Jianhua Weng <sup>b</sup>, Saiyan Shi <sup>a</sup>, Hua Han <sup>a</sup>, Chengmeng Chen <sup>c</sup>

<sup>a</sup> *Energy and Power Engineering College, University of Shanghai for Science & Technology, Shanghai 200093,*

*China*

<sup>b</sup> *Energy and Mechanical Engineering College, Shanghai University of Electric Power, Shanghai 200090, China*

<sup>c</sup> *Institute of Coal Chemistry, Chinese Academy of Science, Shanxi 030001, China*

## Abstract

The heat transfer performance of oscillating heat pipes (OHPs) with graphene nanoplatelet (GNP) nanofluids was investigated experimentally. In these experiments, the GNP nanofluid concentrations were 1.2, 2.0, 5.7, 9.1, 13.8, and 16.7 vol.%, the heating power ranged from 10–100 W, and the filling ratios were 45%, 55%, 62%, 70%, and 90%. The results indicate that the heat transfer performance of OHPs is improved by using GNP nanofluids as the working fluid compared to an OHP with deionized water (DW). At appropriate filling ratios (55%, 62%, and 70%), the optimum range of GNP nanofluid concentrations was 2.0–13.8 vol.%. The maximum reduction in thermal resistance was 83.6% for an OHP filled with a 2.0 vol.% GNP nanofluid compared to the DW OHP at the same filling ratio (62%) and heating power (80 W). At a low filling ratio (45%), adding GNP nanofluids to DW could alleviate dry-out and improve the heat transfer performance of the OHP.

## Keywords:

GNP nanofluids; Oscillating heat pipe; Thermal resistance; Heat transfer performance

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