ABSTRACT

The use of nanofluids as a heat transfer fluid has drawn considerable attention recently. Within the last five years, work investigating the pool-boiling of these fluids has increased dramatically. However, they have produced some varying results that need further investigation to interpret. An experimental study was performed studying the behavior of gold nanofluids during pool-boiling. It was found that while the heat transfer decreased about 20% over the basefluid, critical heat flux (CHF) was increased 2.8 times for 3 nm sized particles and over 3.5 times for 15 nm particles. A surface deposition occurred that is found to be the source of the altered boiling curves. Further investigation was performed to determine the source of this enhancement including an examination of the wetting characteristics of the surface. However, using existing correlations predicting CHF, it was seen that the surface wetting likely is not the sole source of the enhanced CHF.