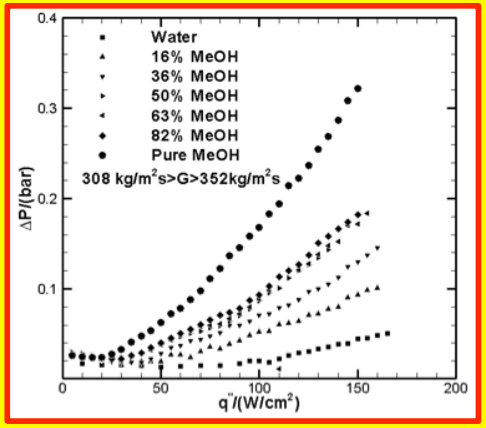
Investigation of Flow Boiling Heat Transfer to Binary Mixtures in Micro-Channels

Weilin Qu, Department of Mechanical Engineering, University of Hawaii at Manoa

The project investigated the various transport phenomena (flow boiling heat transfer, two-phase pressure drop, flow pattern, and flow instabilities) associated with flow boiling of methanol-water binary mixtures in parallel rectangular micro-channels having a 240 micron by 630 micron cross section. Flow boiling of binary mixtures in micro-scale structures has received little research attention so far and could be quite different from flow boiling of pure liquids in identical geometries due to the effect of mixture composition (mixture effect).

- For a given dissipative heat flux, pressure drop increases with increasing methanol molar fraction



- For a given vapor quality, heat transfer coefficient decreases with increasing methanol molar fraction