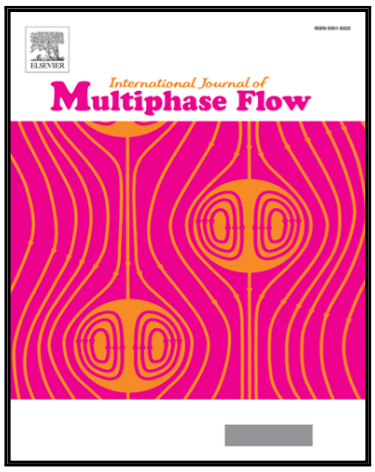

Control of minimum film-boiling quench temperature of small spheres with micro-structured surface

Jun-young Kang , Gi Cheol Lee , Massoud Kaviany ,
Hyun Sun Park , Kiyofumi Moriyama , Moo Hwan Kim

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Highlights

- Minimum film-boiling quench temperature is strongly influenced by surface micro-structures, due to liquid-solid contact in film boiling.
- Liquid-solid contact in film boiling is caused by local temperature drop of micro-structures.
- Local temperature drop of surface micro-structures can be explained by fin-theory with conical-spine geometry
- Dimensionless number *hybrid Biot number* Bi_h elucidates the local temperature drop, causing liquid-solid contact.
- T_{MFB} increase is related to the Bi_h, containing the thermal conductivity, height and base diameter of micro-structures.
- Proposed model suggests that surface micro-structures with high Bi_h makes T_{MFB} increase be maximized.