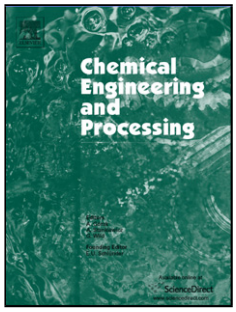

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Thermal performance of meso-scale oscillatory baffled reactors

Safaa M. R. Ahmed [a, b,*], Richard Law [a], Anh N. Phan [a], Adam P. Harvey [a]

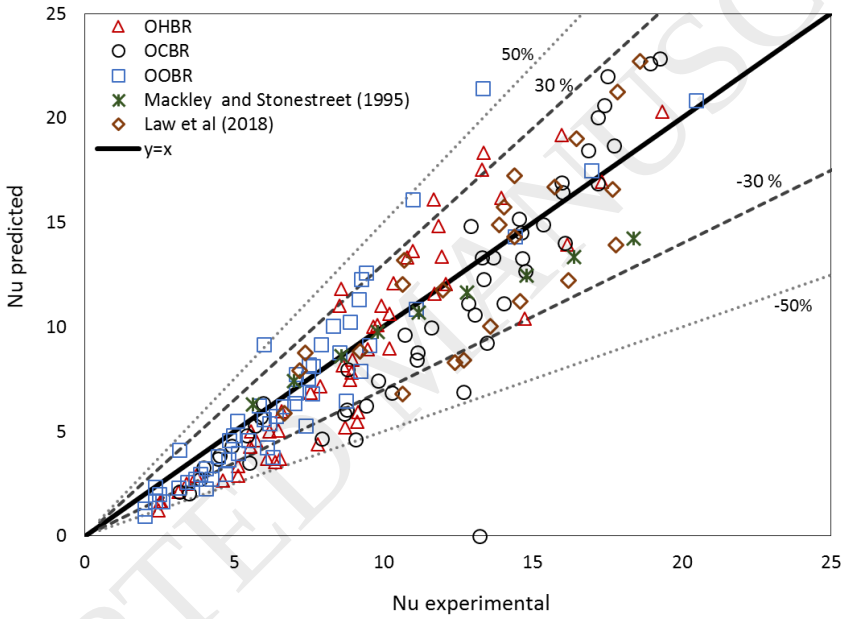
[a]School of Engineering, Newcastle University, Merz Court, Claremont Road, Newcastle Upon Tyne NE1 7RU, UK

[b] Department of Chemical Engineering, College of Engineering, Tikrit University, Tikrit, Salah ad Din, Iraq.

[*]Corresponding Author (Email: s.m.r.ahmed@ncl.ac.uk, mobile: 07774101215)

Graphical Abstract

Validation of developed correlations for predicting Nusselt number (Nu) in different designs of mesoscale oscillatory baffled reactors: oscillatory helical baffled reactor (OHBR), oscillatory central baffled reactor (OCBR), and oscillatory orifice baffled reactor (OOBR).



Highlights:

- Heat transfer in various designs of meso-OBRs was characterised.
- Effect of operating conditions on Nu and ΔP results was investigated.
- Thermal performance for the meso-OBRs was evaluated.
- Correlations for predicting pressure drop and Nusselt number were established.

Abstract

This study reports the evaluation of heat transfer characteristics and pressure drops in three designs of meso-scale oscillatory baffled reactors over the net flow range Re_n = 60- 2500 and the oscillatory flow range Re_o = 0-1600. The three designs were the oscillatory central baffled reactor (OCBR), the oscillatory helical