

Accepted Manuscript

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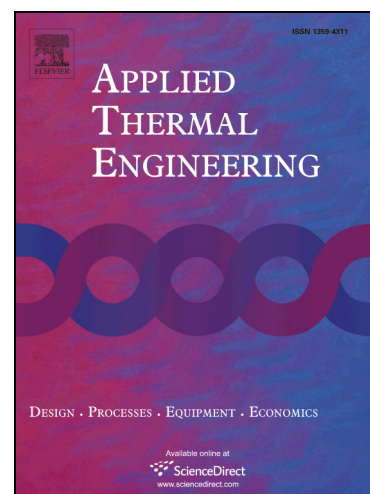
PII: S1359-4311(16)32349-3
DOI: <http://dx.doi.org/10.1016/j.applthermaleng.2016.10.076>
Reference: ATE 9278

To appear in: *Applied Thermal Engineering*

Received Date: 20 June 2016
Revised Date: 22 September 2016
Accepted Date: 11 October 2016

Please cite this article as: W. Bogacz, M. Lemanowicz, M.H. Al-Rashed, D. Nakonieczny, T. Piotrowski, J. Wójcik, Impact of roughness, wettability and hydrodynamic conditions on the incrustation on stainless steel surfaces, *Applied Thermal Engineering* (2016), doi: <http://dx.doi.org/10.1016/j.applthermaleng.2016.10.076>

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Impact of roughness, wettability and hydrodynamic conditions on the incrustation on stainless steel surfaces

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KEYWORDS: incrustation, crystallization fouling, heat exchange surface, roughness, wettability.

ABSTRACT

The goal of this work was to investigate the influence of the stainless steel surface roughness and wettability on incrustation of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ from aqueous solutions and resulting heat transfer resistance. The experiments were done for laminar flow ($\text{Re} = 59 \div 178$) which is characteristic for regions of apparatus where fouling usually begin. A series of steel plates (X5CrNi18-10) were prepared and used as a heat transfer surfaces. Their properties, i.e. roughness, wettability and elementary composition of surfaces were determined. The experiments were done using specially designed flow cell equipped with Peltier element. Each incrustation measurement lasted for two hours, during which heat transfer resistance was measured as a function of time. After the experiments the mass of crystalline deposit was weighted. It was proved that wettability as well as surface roughness cannot be considered separately in

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