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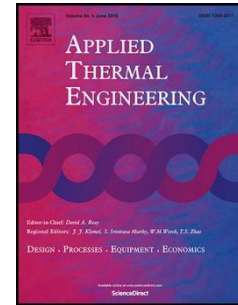
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An assessment of in-tube flow boiling correlations for ammonia-water mixtures and their influence on heat exchanger size

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Highlights

- Assessment of in-tube flow boiling correlations for ammonia-water mixtures
- The impact of correlation choice on heat exchanger size is quantified
- Two Kalina cycle cases are considered: a hot gas boiler and an oil based boiler
- The differences in area predictions are within 6 % and 28 % for the two cases
- The nucleate boiling contribution is small compared to the flow boiling contribution

Abstract

Heat transfer correlations for pool and flow boiling are indispensable for boiler design. The correlations for predicting in-tube flow boiling heat transfer of ammonia-water mixtures are not well established in the open literature and there is a lack of experimental measurements for the full range of composition, vapor qualities, fluid conditions, etc.

This paper presents a comparison of several flow boiling heat transfer prediction methods (correlations) for ammonia-water mixtures. Firstly, these methods are reviewed and compared at various fluid conditions. The methods include: (1) the ammonia-water specific flow boiling correlations from the open literature, (2) the ammonia-water specific

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