

# Accepted Manuscript

Title: Influence of fluorinated self-assembled monolayer on wetting dynamics during evaporation of refrigerant-oil mixture on metal surface

Author: Hao Peng, Lingnan Lin, Guoliang Ding

PII: S0140-7007(17)30141-X

DOI: <http://dx.doi.org/doi: 10.1016/j.ijrefrig.2017.04.005>

Reference: IJIR 3606

To appear in: *International Journal of Refrigeration*

Received date: 25-12-2016

Revised date: 17-3-2017

Accepted date: 11-4-2017

Please cite this article as: Hao Peng, Lingnan Lin, Guoliang Ding, Influence of fluorinated self-assembled monolayer on wetting dynamics during evaporation of refrigerant-oil mixture on metal surface, *International Journal of Refrigeration* (2017), <http://dx.doi.org/doi: 10.1016/j.ijrefrig.2017.04.005>.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Influence of fluorinated self-assembled monolayer on wetting dynamics during evaporation of refrigerant-oil mixture on metal surface

Hao Peng<sup>a</sup>, Lingnan Lin<sup>b</sup>, Guoliang Ding<sup>b,\*</sup>

<sup>a</sup> Merchant Marine College, Shanghai Maritime University, Shanghai 201306, China;

<sup>b</sup> Institute of Refrigeration and Cryogenics, Shanghai Jiao Tong University, Shanghai 200240, China)

\* Corresponding Author, Tel: +86-21-34206378; Fax: +86-21-34206814; E-mail: [glding@sjtu.edu.cn](mailto:glding@sjtu.edu.cn)

## Highlights

- Influence of F-SAM on wetting dynamics was experimentally investigated.
- F-SAM changes evaporation mode of refrigerant-oil mixture on metal surface.
- F-SAM decreases rising liquid height in evaporation of refrigerant-oil mixture.
- F-SAM influence factor decreases with the increase of surface roughness.
- F-SAM influence factor decreases with the increase of oil mass fraction.

## Abstract

Reducing wettability of a metal surface is a promising method for enhancing boiling heat transfer of refrigerant-oil mixture on the metal. As fluorinated self-assembled monolayer (F-SAM) coating is effective for wettability reduction, its influence on wetting dynamics including meniscus shape, contact angle, contact line velocity and rising liquid height during evaporation of refrigerant-oil mixture on metal surface were experimentally investigated. The refrigerant-oil mixture was prepared by R141b and NM56, the oil mass fraction ranged from 0 to 10 wt%, and the surface roughness ranged from 0.028 to 1.166  $\mu\text{m}$ . The results show that during evaporation of refrigerant-oil mixture, the presence of F-SAM changes the evaporation mode to be constant contact line velocity followed by both constant contact

Download English Version:

<https://daneshyari.com/en/article/5017252>

Download Persian Version:

<https://daneshyari.com/article/5017252>

[Daneshyari.com](https://daneshyari.com)