Effect of hydrophilic properties of packings on mass transfer performance of water distillation

Zhiwei Zhang¹, Zhengliang Zhang¹, Xubin Zhang², Zheng Wang¹, Fumin Wang², Guobing Li², Xu Zhang¹, Xingtao Wang¹, and Qingzhao Liu¹

¹Affiliation not available ²Tianjin University

July 13, 2022

Abstract

Water distillation is an effective method for detribution and deuterium enrichment. This study focuses on the effect of the wettability of the packings surface on the separation performance of the H2O-HDO system. Hydrophilic coatings with different structures are prepared on the surface of copper packings by the method of alkaline erosion and oxidation, and it is found that the hydrophilic coatings with different structures showed different hydrophilic effects. The differences in mass transfer performance of packings with different contact angles are investigated. It is found that with the increase of hydrophilicity, the mass transfer performance of the packing is relatively improved. By combining empirical models of mass transfer and experimental data, a mathematical model for predicting the height of equal plate (HETP) is established to quantify the effect of wetting properties on the mass transfer process.

Hosted file

manuscripts.docx available at https://authorea.com/users/494855/articles/576784-effect-ofhydrophilic-properties-of-packings-on-mass-transfer-performance-of-water-distillation