Process intensification of membrane system for crude palm oil pretreatment

ABSTRACT

The pretreatment of crude palm oil (CPO) samples with the aim of moving from the usual huge refinery plant to a more process integrated membrane module at ultrascale size was studied. The study was carried out using conventional refining, microfiltration, and ultrafiltration processes. Reduction of phosphorus fur the membrane-permeate of 43.3% was higher than that of bleached oil of 34.4%. The results show that the average slurry volume after about 22-min runs for membrane with ore size of 0.45 μm, 0.2 μm, 50 nm and 20 nm, and the average slurry volumes are 0.05, 0.09, 0.13, and 0.18m3 respectively.

Keyword: Ceramic materials; Heat treatment; Microfiltration; Phosphorus; Pore size; Slurries; Ultrafiltration; Ceramic membranes; Crude palm oils; Membrane systems; Miniaturization; Crude petroleum