

Performances of sandwich membrane in reclamation of water from final discharged POME

ABSTRACT

An investigation was made to examine the performance of sandwich configurations of paired ultrafiltration membranes in reclamation of water from final discharged POME. Two membranes were sandwiched together in different configurations without spacer. Two types of membrane were used in this study which were PES and RC with MWCO 5kDa. The sandwich configurations were known as SS-Sandwich, SB-sandwich, where S indicates that the skin layer faces the feed and B indicates that support layer faces towards the feed. The result of single membrane was compared with both sandwich arrangement. SS-sandwich configuration showed the best permeate quality for PES MWCO 5kDa. The pollutant reduced range up to 80%-90% compared to single membrane which were 60%-70% range. The quality of permeate obtained for total dissolved solid (TDS), suspended solid (mg/L), turbidity, BOD₅, COD, were 535 mg/L, <25 mg/L, 0.88 NTU, BOD₅ 23.3 mg/L, and 48 mg/L. The quality of permeate from SS-sandwich membrane of 5 kDa was beyond reuse standard and approaching drinking water standard for TSS, TDS and turbidity. Therefore it can be concluded that, water reclaimed from treating final discharged from palm oil mill effluent using ultrafiltration technique with right sandwich configuration at optimum operating conditions was successfully complied with WHO reuse water standard.

Keyword: Ultrafiltration; Membrane fouling; Sandwich membrane; Reclamation