Modelling and simulation of free fatty acids stripping from bleached palm oil

ABSTRACT

The presence of free fatty acids (FFAs) and odoriferous components in the bleached palm oil (BPO) need to be removed to meet the specific standard quality and make the oil palatable. Because FFAs and odoriferous components is more volatile than the main oil components, they vaporize readily thus being removed from the oil product. Deodorization is the key process in industry to remove FFAs by vaporizing them using stripping agent such as steam under vacuum. In this work, a simulation study was adopted for the analysis of deodorization process implemented in Aspen HYSYS software. The deodorization process was modelled using absorber column unit operation in the software. The process conditions and BPO compositions fed into the deodorizer were taken from literature, and was validated against real plant data obtained from the same literature source. The simulation result well represented the real plant data for TGs composition in the RBDPO, with percentage deviation of 0.05%. The deodorization of BPO was analyzed by studying the column profiles such as liquid and vapor mass flowrate, temperature, and composition profiles, with respect to the tray position. From the simulation study under defined process conditions, the percentage removal of FFAs from the BPO was 98.96%.