Effects of different types of surfactants on AC breakdown voltage of refined, bleached and deodorized palm oil based CuO nanofluids

ABSTRACT

In this paper, the effects of different types of surfactants on AC breakdown voltage of Refined, Bleached and Deodorized Palm Oil (RBDPO) olein in the presence of Copper (II) Oxide (CuO) nanoparticle were investigated. The AC breakdown voltage measurement was carried out based on ASTM D 1816 at gap distances of 1 mm. Sodium Dodecyl Sulfate (SDS) as anionic surfactant, oleic acid (OA) as non-ionic surfactant and Cetyl Trimethyl Ammonium Bromide (CTAB) as cationic surfactants were used to investigate the influence of different concentrations surfactants on the AC breakdown performance of RBDPO. The concentrations were varied at 25%, 40%, 50%, 60% and 75% of volume percentage based concentration of 0.05% CuO. The results showed an enhancement of AC breakdown voltage under presence of SDS, OA and CTAB until 50% volume of concentration.

Keyword: Refined, bleached and deodorized palm oil; Sodium dodecyl sulfate; Oleic acid; Cetyl trimethyl ammonium bromide; Copper (II) oxide; AC breakdown voltage