

Phase behaviour of nonionic surfactants in new palm oil esters-based emulsion for glyphosate isopropylamine formulation

ABSTRACT

Phase behaviour of emulsion system palm oil esters/nonionic surfactant (s)/water with 41% (w/w) pesticide active, glyphosate isopropylamine was studied via construction of pseudoternary phase diagrams. The nonionic surfactants were long-chain alkylpolyglucosides (LAPG), medium-chain alkylpolyglucosides (MAPG) and polyoxyethylene (4) lauryl ether (Brij 30). Phase behaviour study showed that no monophasic region was found with LAPG, MAPG and Brij 30 alone. Isotropic region, a transparent monophasic region was successfully obtained with mixed surfactants LAPG:Brij 30 and MAPG:Brij 30 at ratios 9:1, 8:2, 7:3 and 9:1, 8:2, 7:3, 6:4, respectively. Hydrophilic-lipophilic balance (HLB) values of the mixed surfactants calculated for the largest isotropic regions were 11.62 and 11.87, respectively. This preliminary study of phase behaviour determination is important for the selection of composition in the stable pesticide formulations.

Keyword: Phase behaviour; Alkylpolyglucosides; Palm oil esters; Glyphosate isopropylamine; Pesticide formulation