

ATTEMPTS TO PREPARE MICROPOROUS POLYMER REPELLENT MATRICES

Alcides Siteo

Institute of Applied Materials, Department of Chemical Engineering, University of Pretoria, Private Bag X20,
Hatfield 0028, Pretoria, South Africa

ABSTRACT

Malaria is being considered a serious global health problem, which affects mainly sub developed countries especially in Africa where insecticides are used for malaria control. Polymeric membranes are being produced using the Thermal induced Phase Separation (TIPS) where the phase separation can initiate in the unstable region by spinodal decomposition mechanism forming interconnected with uniform structures. The aim of this study is to prepare microporous polymer repellent matrices via spinodal decomposition. For this objective were used DEET, IR3535, Citriodiol and Ethyl 2-aminobenzoate as repellents and LLDPE, Blend (LLDPE/HDPE, 1:1) and EVA (9% VA) as polymers. The mixtures of the polymers – repellents (50 – 50 %w) were compounded and extruded on a Haake MiniLab II laboratory co-rotating twin screw micro-compounder to form a microporous polymer filaments. The polymer filaments were characterized by DSC/TGA and Ultra SEM. The DSC/TGA results showed that LLDPE trapped much quantity of Citriodiol (over 50%) and the SEM results showed that Citriodiol and DEET forms microporous structures with LLDPE while IR3535 forms with EVA (9% VA).

Key words: spinodal decomposition; repellent; microporous.