

TRANSPORT BEHAVIOUR OF XYLENE THROUGH COMPATIBILIZED LOW DENSITY POLYETHYLENE COMPOSITE

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ABSTRACT

The transport behaviour of xylene through compatibilized low density polyethylene (LDPE) composite was investigated at different temperatures 40 °C, 60 °C and 80 °C. The kola nut used was ground to 25 µm particle size. In preparation of the composite, 0 – 5 wt% of kola nut powder and 0 – 2.5 wt% of the compatibilizer were thoroughly mixed with 200g of low density polyethylene in an injection moulding machine. The injected LDPE/Kolanut composites were taken for sorption test. The sorption data obtained for the composite at different temperatures investigated were expressed as the mole percentage uptake, Q_t (mole %). Results showed that the mole percent uptake of xylene at the five filler contents (0 – 5 wt%) generally increased with increase in sorption temperature but decreased with increase in compatibilizer and filler content. This can be seen at 80 °C and 0, 1, 1.5 and 2.5 wt% of the comptbilizer respectively. The molar percentage uptake of xylene at 1 wt% of the filler yielded the following values; 8.7876, 8.5962, 8.4056 and 8.3111 respectively. At 2 wt5, it yielded 7.9812, 7.9104, 7.7423 and 7.7199 respectively; at 3 wt% it gave 7.8232, 7.6351, 7.5663 and 7.4652 respectively; at 4 wt%, it yielded 8.4120, 8.3315, 8.2132 and 7.9667 respectively and at 5 wt% it gave 7.9635, 7.8630, 7.6256 and 7.5013 respectively.

Keywords: Sorption, kolanut, polyethylene, composite, xylene.