Abstract

The kinetics of biodegradation of palm-derived fatty methyl and ethyl esters (Elaeis guineensis biodiesel) by a wild-type aerobic bacterial population was measured at 20 °C, as the rate of oxygen uptake by a manometric technique. The methyl and ethyl biodiesels were obtained by potassium-hydroxide catalysed transesterification of palm oil, respectively. The bacterial flora included the genera Bacillus, Proteus, Pseudomonas, Citrobacter and Enterobacter. The rate of oxygen uptake for palm biodiesel is similar to the quantity observed in the biodegradation of 1.0 mM solutions of simple substrates such as carbohydrates or amino acids. Palm methyl or ethyl biodiesel is subjected to facile aerobic biodegradation by wild-type bacteria commonly present in natural open environments. This result should lessen any environmental concern for its use as alternative fuel, solvent or lubricant.

Keywords

Palm biodiesel, fatty esters, Elaeis guineensis, wild-type bacterial degradation, kinetics.