

Biodiesel Fuel from Palm Oil using Supercritical Methanol and Co-solvent R 141b

김진우, 홍승태, 유기풍, 임종성*
서강대학교
(limjs@sogang.ac.kr*)

Transesterification reaction of palm oil in supercritical methanol was investigated without using any catalyst. The supercritical method requires a high molar ratio of alcohol to oil in order to reach a high FAME (Fatty Acid Methyl Esters) yield. As the consumption of methanol increases, it requires a high production cost and energy to evaporate and recover the methanol. To solve these problems, HCFC-141b as a co-solvent was used in the supercritical methanol process. The addition of HCFC-141b increased the FAME yield and allows the reaction to be carried out under significantly milder conditions compared with the system without co-solvent. In addition, the FAME yield increased even at the lower molar ratio of methanol to palm oil. HCFC-141b allows the reaction mixture to form a single phase under the supercritical conditions. Formation of the single phase results in a more efficient transesterification reaction due to the increased contact area between methanol and palm oil. Thus, the amount of methanol used in the transesterification could be reduced by the addition of co-solvent.