Identification of Oxidation Product of Various Biodiesel and Its blends under Accelerated Oxidation Conditions

김재곤*, 서정주[1], 전철환, 임의순, 신성철, 김동길
한국석유품질관리원; [1]한국기초과학지원연구원 서울센터
(jkkim@kipeq.or.kr*)

The problem of biodiesel is to undergo the oxidative degradation over time, mainly influenced by temperature and oxygen. When it is used by fuel, oxidized products of biodiesel from degradation may cause some problems in engine and injection. The oxidation stability of biodiesel depends on the fatty acid compositions. Therefore, biodiesel blends (0.5, 1, 3, 5, 10, 20 vol. %) and biodiesels (100 vol. %) were examined to recognize oxidation characteristics rapidly at 100 ℃ under accelerated oxidation conditions. From the analysis of biodiesels and its blends after accelerated oxidation, it was considered that density, kinematic viscosity, and acid number should proportionally increase because those showed increased values as oxidation time. Oxidation products after accelerated oxidation were identified by 1H-NMR, FT-IR, GC, and FT-orbitrap APCI MS to propose oxidation mechanism. In addition, it was synthesized by Diels-Alder reaction to compare with oxidation products to produce by accelerated oxidation.