

Biodiesel Thermophysical Properties

Joseph Bell^{C,S}, Aaron Harrison, Ryan Gee, Neil Giles, Richard Rowley and W. Vincent Wilding
Brigham Young University, Chemical Engineering Department, Provo, UT, U.S.A.
jcbell22@gmail.com

Biodiesel is produced from vegetable oils through transesterification. This reaction produces a mixture of fatty acid esters, glycerol, and alcohol. Separation of the fatty acid esters and glycerol can be accomplished through liquid-liquid extraction by water addition. Designing liquid-liquid extraction processes requires ternary liquid-liquid equilibrium (LLE) data for mixtures of water, glycerol, and fatty acid esters. Ternary mixture LLE data have been experimentally measured for several systems of interest. Systems include mixtures with the methyl esters of lauric, myristic, palmitic, and stearic acids. Data were collected at atmospheric pressure and 60°C. The results of these ternary measurements have been correlated using the NRTL equation. These data can be used to improve separations efficiency in transesterified biodiesel fuels.