

Spray characteristic of palm biofuel blends

Abstract

The present numerical study on spray characteristic of biofuels, which is the blend of Refined, Bleached and Deodorized Palm olein (RBDPO) and Commercial Diesel Fuel (CDF) in gas turbine, is important. This type of study is a major concern all over the world due to global issues for example pollution, shortage of fuel and economic crisis. This study is mainly focused on spray characteristic for various palm olein biofuel blends. Spray characteristic of various biofuel blends will be analyzed and compared to pure diesel. Biofuel blends that have different blending ratio - B5, B10, B15, B20, and diesel will be studied and the chemical properties of various biofuel blends can be determined after having several measurements in laboratory. Numerical study was conducted by using Gambit and FLUENT software to observe the spray characteristic such as Sauter Mean Diameter (SMD) and penetration for different biofuel blends. Verification and validation is an important way to ensure that the mathematical model can be used in this case studies. The k-epsilon model has successfully predicted the spray characteristic of all biofuel blends such as Sauter Mean Diameter and penetration of droplet particle and a correlation has been established.