Abstract Submitted for the MAR15 Meeting of The American Physical Society

Study of effects of transport properties of a biodiesel derived from soybean on the mixture process formation using CFD OpenFOAM¹ ADOLFO BENITEZ MOLINA, OSCAR ALEJANDRO DE LA GARZA DE LEON, SIMON MARTINEZ MARTINEZ, FAUSTO ALEJANDRO SANCHEZ CRUZ, Universidad Autónoma de Nuevo Leon-FIME, LIITE-Laboratory for Research and Innovation in Energy Technology, Mexico — In this work has been studied the effects of the transport properties of biodiesel derived from soybean on the mixing process, using a CFD code OpenFOAM. For this the most relevant properties in this mixing process have been determined: density, viscosity, surface tension and vapor pressure. These fuel properties govern the spray formation however, there are only very limited studies that determined for its subsequent implementation in a CFD code, such as the OpenFOAM code. Such properties were obtained using empirical correlations based on the molecular structure of the fatty acids that compose the biodiesel and applying nonlinear regression are implemented in the programed models used in the OpenFOAM code for a diesel spray simulation. The results achieved in the present study on the one side, have been confirmed how the biodiesel properties affect the mixture process, and on the other side, the obtained coefficients which can be used in the proposed models by the CFD code OpenFOAM for the implementation of this properties as a temperature function without the correlations based on the molecular structure of the fatty acid.

¹Also they thank the CONACYT from Mexican Government for granting the Master degree of Adolfo Benitez

Adolfo Benitez Molina Univ Autonoma de Nuevo Leon

Date submitted: 14 Nov 2014 Electronic form version 1.4