Environmental Engineering and Management Journal *May 2014, Vol.13, No. 5, 1317-1325*
http://omicron.ch.tuiasi.ro/EEMJ/

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INVESTIGATION ON IMPACT OF BIODIESEL ON INJECTION PROCESS OF UNIT PUMP FUEL SYSTEM

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Abstract

This work investigated the impacts of biodiesel properties on the complete fuel injection process of a high-pressure unit pump (UP) fuel system. Analysis based on a one-dimension flow model in the UP system deduces that both the injection pressure and the pressure changing rate may be affected by the fuel properties. A serial of experiments were conducted under varied operation conditions to compare the influences of the diverse fuel properties on the fuel injection process. The test results verify this deduction that the different properties of biodiesel have considerable influences on the process of pressure building. The peak injection pressure of biodiesel fuel is relatively higher than that of diesel. In addition, for biodiesel, the changing rate of the rising process of the injection pressure is also faster. However, the fuel properties have no obvious effects on pressure drop process. Meanwhile, the injection timing advance becomes larger as biodiesel fuel is used. Furthermore, with the increase of fuel pressure, the influences of fuel properties on injection increase.

Key words: biodiesel, injection pressure, injection timing, unit pump system

Received: November, 2013; Revised final: February, 2014; Accepted: March, 2014

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