

Spray Characteristics of a Urea Injector Chamber to Improve NO_x Conversion Efficiency for Diesel Engines Fueled with Biodiesels

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Abstract : The urea-SCR catalyst system has the advantages of high NO_x conversion efficiency and a wide range of operating conditions. The key factors for successful implementation of urea-SCR technology is good mixing of urea (ammonia) and gas to reduce ammonia slip. Urea mixer components are required to facilitate evaporation and mixing, because it is difficult to evaporate urea in the liquid state; the injection parameters are the most critical factors affecting mixer performance. In this study, The effect of urea injection on NO_x emissions in a six-cylinder, four-stroke internal combustion engine fueled with B80 biodiesel has been experimentally investigated. The results reveal that urea injection leads to a reduction of NO_x emissions of B80 biodiesel fuel. Moreover, the influence of injection parameters on NO_x reductions has been studied. The findings show that by increasing the injection temperature, more reduction in NO_x emissions has been occurred. Also, urea mass flow rate increment leads to more NO_x reduction. The same result has been obtained by an increase in spray angle.

Keywords : urea, NO_x emissions, diesel engines, biodiesels

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