

Utilization of waste hydraulic oil as fuel in diesel engine

Abstract

Production of alternative diesel fuel has been increasing drastically in many Asian countries. Since the reduction of petroleum production by Organization of Petroleum Exporting Countries (OPEC), the research on alternative fuel for diesel engine has gain interest. The target of this project is to substitute some percentage usage of conventional diesel fuel with waste substance without compromising on engine performance and exhaust emissions. This study has produced two type of alternative fuels. A test fuel consisting 30% of water into diesel fuel with the existence of additive or emulsifier (span 80) is called as DW Emul. Another test fuel which is named as DHW Emul produced by blending 30% of water into a mixture consisting of 20% of waste hydraulic oil and 80% of diesel fuel with the existence of span 80. The engine performance and exhaust emissions of DW Emul and DHW Emul are measured and has been compared with the conventional diesel fuel. A 600cc single cylinder direct injection diesel engine was used. The experiment was conducted at 1500 rpm with variable engine loads. Results show that DHW Emul and DW Emul has higher brake specific fuel consumption (BSFC). However, by considering the total use of diesel fuel contained in DW Emul, the quantity was lower at all loads. The same goes for DHW Emul at low load but deteriorate at high load which show slightly higher compared with of using 100% conventional diesel fuel. DHW Emul has suppressed CO emission that is usually high of using emulsion fuel to the level similar to conventional diesel fuel. NO_x and Smoke emissions for DHW Emul are lower than conventional diesel. The use of DHW Emul can give significant reduction of NO_x and Smoke emissions without deterioration of CO emission.