

生物质热解生物油/柴油乳化燃料的制备与试验 Preparation of Emulsified Fuel from Biomass Pyrolysis Derived Bio-oil and Diesel and Their Use in Engine

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关键词: 生物油 柴油 乳化剂 乳化燃料 排放特性

摘要: 制备了生物油/柴油乳化燃料并在柴油机台架上进行了试验。试验用生物油是在流化床反应器上对玉米秸秆粉进行热解试验获得的。将生物油与0号柴油以及适量的乳化剂混合, 通过均质机均质, 得到生物油/柴油乳化燃料。在ZS1110型柴油机台架上进行两种不同配比的生物油/柴油乳化燃料的发动机台架试验, 得出了柴油机燃用生物油/柴油乳化燃料和纯柴油的负荷特性和排放特性曲线, 并且对乳化燃料和纯柴油的油耗率和有效热效率进行了对比。研究表明: 生物油体积分数为15%的生物油/柴油乳化燃料较纯柴油有明显的节油效果, 最大节油率可达10%; NO、CO的排放也优于纯柴油的排放。Emulsified fuel from biomass pyrolysis derived bio-oil and diesel was prepared and fueled to a laboratory diesel engine tester. The experimental bio-oil was obtained from the pyrolysis of corn stalk powders in a fluidized bed reactor. The emulsified fuel was produced by mixing the bio-oil with commercial No.0 diesel oil as well as surfactants using a homogenizer. The performances of bio-oil/diesel oil emulsified fuels with two different bio-oil/diesel oil ratios were tested on a ZS1110 diesel engine. Consequently, the load characteristic and exhaust emission characteristic curves of diesel engine were determined, and the specific fuel consumption and effective thermal efficiency of the engine fueled with the emulsified fuel were analyzed in comparison with that of the pure No. 0 diesel oil. The experimental results show that, when the engine is fueled with the emulsified fuel at bio-oil concentration of 15%, the specific fuel consumption is lower and the effective thermal efficiency is higher than that of the pure No.0 diesel oil. The highest fuel saving rate reached 10%. Moreover, the NO and CO emissions are lower than that of the pure No.0 diesel oil.

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