

عنوان مقاله:

A simulation and experimental study of the effect of hydrogen added to diesel fuel on performance and exhaust emissions in diesel engine

محل انتشار:

مجله علم مهندسی خودرو، دوره 11، شماره 2 (سال: 1400)

تعداد صفحات اصل مقاله: 14

نویسندگان:

Javad Zareei - assistant professor

Abbas Rohani - Department of Biosystems Engineering, Faculty of Agriculture, Ferdowsi University of Mashhad, Mashhad, Iran

خلاصه مقاله:

Diesel engines are the most trusted sources in the transportation industry. They are also widely used in the urban transportation system. Most pollutants are related to these engines. Therefore, it is important to increase the performance and reduce exhaust emissions of these engines. Alternative fuels are key to meeting upcoming targets. An experimental and numerical study was performed to investigate the effect of diesel fuel and hydrogen addition to diesel fuel from 0 to 3% on performance and exhaust emissions. Also in this research for changing diesel fuel, an indirect injection engine converted to direct injection engine. The simulation study was conducted by Star cd codes and experimental investigation was carried out on a diesel engine (Perkins 1103A-33TG1), three- cylinders, and four-stroke with maximum engine power 72.3hp at 1800 rpm. The results from this study showed that the increase of hydrogen to diesel fuel improves the thermal efficiency, resulting in lower specific fuel consumption. Also, the results showed that adding hydrogen until 3%, the cylinder pressure increase by about 9% and occurred the delay of peak pressure about 8 degrees of a crank angle compared to diesel fuel. The other obtained results in emission with 3% H_2 +Diesel showed the soot emission reduced 11.3%, HC and CO reduced nearly 36%, but NO_x increased by about 8.3% due to high combustion temperature.

کلمات کلیدی:

Diesel engine, hydrogen fuel, compressed ignition engine, performance, exhaust emissions

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1865253>

