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EMISSION STUDY ON JATROPHA ENGINES

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Abstract:

The increasing demand for sustainable and eco-friendly energy sources has driven research into alternative fuels. Jatropha curcas, a non-edible oilseed plant, has emerged as a promising biofuel source due to its high oil content, adaptability to arid regions, and minimal competition with food crops. This study explores the feasibility of using Jatropha biodiesel in internal combustion engines, analyzing its performance, emissions, and efficiency compared to conventional diesel. The findings indicate that Jatropha-based biodiesel exhibits comparable thermal efficiency with reduced carbon monoxide (CO), hydrocarbon (HC), and particulate matter emissions. However, a slight increase in nitrogen oxides (NOx) emissions was observed, which could be mitigated through engine modifications and exhaust treatment technologies. Additionally, the study examines the economic viability and sustainability of large-scale Jatropha cultivation for biofuel production. The results suggest that Jatropha biodiesel is a viable alternative fuel that can contribute to reducing fossil fuel dependency and mitigating environmental impacts. Further research is recommended to optimize engine compatibility and improve biodiesel processing techniques.

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