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Analysis on emissions of SI engine with variable ethanol-gasoline blends

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Abstract:

Global transportation sector is facing three major challenges, namely depletion of fossil fuels, volatility in crude oil prices and stringent environmental regulations. This research mainly focused on the use of biofuels, Ethanol is one of most suitable alternative blending fuel due to its better fuel quality and environmental benefits. In the present work, an ultrasonic bath was used to assure optimal mixing of ethanol and gasoline in various proportions (10% ethanol + 90% gasoline, 20% ethanol + 80% gasoline, 30% ethanol + 70% gasoline, and 40% ethanol + 60% gasoline). This will boost the fuel efficiency. A one-cylinder, four-stroke and spark ignition engine was used to study and analyze the effect of ethanol's/gasoline blend on exhaust gases. Result shows that adding ethanol reduces harmful exhaust gases (CO, CO₂, NO_x, and HC). Less exhaust emissions are seen to accompany higher ethanol levels. Ultimately, it is discovered that ethanol blends have a higher research octane number. Even though a higher heating value was discovered in gasoline compared to ethanol.

Keywords:

Ethanol, Octane Number, gasoline, SI Engine, Emissions etc.