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Effect of compression ratio and exhaust gas recirculation on diesel-biodiesel blends for performance and emission characteristics: An experimental investigation

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Experiments were performed on a 4-stroke, single cylinder, variable compression ratio (VCR) diesel engine with pure diesel as a baseline fuel and blends of diesel and biodiesel with 0.5% ethyl hexyl nitrate (EHN) at different compression ratios (CR) such as 15:1, 16.5:1, 18:1 and 19.5:1 and at 20% EGR. From experimental investigations, it is found that with increase in CR, better performance is observed. The increase in CR increases the cylinder gas pressure and temperature and also the mixture concentration at the end of the compression stroke. As a result of this, burning rate increases and consequently thermal efficiency increases. Maximum BTE obtained is 32.3% at a compression ratio of 19.5:1 when compared to 30.25% at 16.5:1. However, at higher compression ratios (i.e., at 19.5:1), NO_x emissions are higher and also increase in BTE is insignificant. Hence, optimum CR is 18:1.

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Analytical analysis of the xEV standards

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This paper provides an all-inclusive state of the art analytical analysis of major categories of electrified transportation (xEVs) standards, issued by the world wide standardization organizations. Firstly, the current status for the standards by major organizations is presented followed by the graphical representation of the number of standards issued. The review then takes into consideration the interpretation of the xEVs standards developed by all the major standardization organizations across the globe. The standards are then differentiated categorically to deliver a coherent view of the current status followed by the explanation of the crux of these standards. This detailed elucidation of the standards will assist the researchers, reviewers and experts to find all the standards available in open literature at one platform and compare the merits and demerits of various standards. Further, the description of the status quo of the xEVs sector in India is outlined, which is of significant importance considering the increasing influence of electric mobility in the Indian transportation sector. This work will be valuable, principally to the automotive industry, as reference for product development applicable to numerous worldwide markets.

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