Correction to: Potentials of waste plastic pyrolysis oil as an extender fuel for diesel engine

Mukul Tomar¹ · Amit Jain¹ · Prashant Chandra Pujari¹ · Hansham Dewal¹ · Naveen Kumar¹

Published online: 14 August 2020
© Saudi Society for Geosciences 2020

Correction to Arabian Journal of Geosciences (2020) 13:504
<https://doi.org/10.1007/s12517-020-05574-6>

In the article “Potentials of Waste Plastic Pyrolysis Oil as an Extender fuel for Diesel Engine” by Tomar, M., Jain, A., Pujari, P.C. et al. Potentials of waste plastic pyrolysis oil as an extender fuel for diesel engine. Arab J Geosci 13, 504 (2020). (<https://doi.org/10.1007/s12517-020-05574-6>), there were following errors:

Section: Abstract, Page no. 1

- line number **13**: The data value “12.2%” is to be replaced by “8.6%”.
- line number **14**: The sentence “The exhaust emissions were also decreased considerably as the percentage of WPPO in fuel blend is increased.” is to be replaced by “The percentage of exhaust emissions (CO, UBHC, and smoke opacity) was also reduced considerably with the increase in the percentage of WPPO in fuel blend.”
- line number **15**: The sentence “At full load, an overall reduction of about 30% in NO_x, CO, and UBHC emissions was observed for D60B20P20 in comparison with neat diesel.” is to be replaced by “However, except NO_x emission, which was marked higher due to the excess oxygen content.”

Subsection: Ignition probability, Page no. 4

- line number **12 & 13**: The data values “330” and “630” are to be replaced by “535” and “745”, respectively.
- line number **18**: The data values “550” and “610” are to be replaced by “670” and “715”, respectively.

Subsubsection: Brake thermal efficiency, Page no. 5

- line number **1**: The sentence “the change in brake mean effective pressure (BMEP)” is to be replaced by “respect to engine load”.
- line number **9, 10, & 11**: The sentences “at maximum load, a notable decrease in BTE is observed for all the fuels. This is due to the presence of rich fuel-air inside the cylinder at 100% load. A similar trend is observed for all the fuel samples. Moreover, with the increase of WPPO in the diesel-biodiesel blends results in a significant increase of BTE.” are to be replaced by “peak load (100%), due to decrease in air to fuel ratio, the rise in BTE is comparatively less for all the fuels. The addition of WPPO in the diesel-biodiesel blends leads to significant increase in the value of BTE.”
- line number **17**: The data values “26.9”, “28”, “29.1” and “30.2” are to be replaced by “26.4”, “27.1”, “27.3,” and “27.8”, respectively.

Subsubsection: Exhaust gas temperature, Page no. 7

- line number **2**: The word “BMEP” is to be replaced by “engine load” and the sentence “The heat released during the diffusion combustion phase is responsible for the increase of EGT.” is to be replaced by “The more efficient is the combustion inside the cylinder, the higher will be the exhaust gas temperature.”
- line number **4**: The sentence “this heat leaves the engine as a waste and” is to be replaced by “the extra heat liberated during the diffusion phase of combustion”.

The online version of the original article can be found at <https://doi.org/10.1007/s12517-020-05574-6>

✉ Mukul Tomar
mukultomar007@gmail.com

¹ Centre for Advanced Studies and Research in Automotive Engineering, Mechanical Engineering Department, Delhi Technological University, Delhi 110042, India

- line number 11: The sentence “higher ignition probability of the” is to be replaced by “availability of rich oxygen content and higher evaporation rate in”.
- line number 13: The sentence “leading to more efficient combustion” is to be added after the word “oil”.
- line number 13: The sentence “The improvement in ignition characteristics of test fuel blends results in higher heat release in diffusion combustion compared with the premixed phase, leading” is to be replaced by “Thus, resulting in higher heat release rate, which further leads”.
- line number 17: The data values “421”, “430”, “437” and “443” are to be replaced by “512”, “522”, “534,” and “543”, respectively.

Subsubsection: Nitrogen oxides, Page no. 8

- line number 8: The sentence “Figure 8 depicts the variation of NO_x emission with BMEP for different test fuels and neat diesel.” is to be replaced by “Figure 8 depicts the variation of NO_x emission in test fuels and neat diesel with different engine loading conditions.”
- line number 13, 14, 16, 17 & 19: The sentence “follows an unusual trend with engine load. At lower loads, the availability of rich air facilitates the combustion process and results in higher temperature and encourages NO_x formation. D100 showed the highest NO_x emissions among all the test fuel blends. This can be attributed due to higher premixed combustion in diesel, resulting in higher combustion temperature. On the other side, the higher cetane number of test fuel blends results in improved ignition characteristics, thereby reducing the premixed combustion phase.” are to be replaced by “increases with the engine load for all the fuel samples. This is due to increase in rate of combustion and in-cylinder temperature at higher loads which further facilitates the formation of NO_x. D60B20P20 showed the highest NO_x emissions among all the test fuel blends and neat diesel. This can be attributed due to the higher cetane number and availability of rich oxygenated WCO biodiesel and plastic pyrolysis oil present in the fuel blend. The combined effect of both the fuels facilitates the rate of combustion, thus giving rise to higher NO_x emission.”
- line number 22: The data value “4.9”, “4.4”, “3.9” and “3.4” are to be replaced by “648”, “683”, “701”, and “723”, respectively.
- line number 23: The unit “g/kWh” is to be replaced by the unit “ppm”.

Subsubsection: Carbon Monoxide, Page no. 8

- line number 1: The word “BMEP” is to be replaced by “engine load”.
- line number 8: The sentence “Unlike lower load, due to improvement in combustion rate and higher cylinder temperature, the conditions are favourable for complete oxidation of CO to CO₂ at part load, thus decreasing the rate of emission.” is to be added.
- line number 10: The sentence “At higher loads, the deficiency of oxygen is relatively higher, therefore resulting in incomplete oxidation of CO to CO₂ and releasing higher emission.” is to be replaced by “This is because at higher loads, engine requires extra fuel supply, to maintain the necessary constant engine speed, thus giving rise to the fuel-rich zone in the combustion chamber. Due to the supply of rich fuel mixture and deficiency of oxygen, the CO emission rises abruptly.”
- line number 13: The data values “28.6”, “26.3”, “24.2” and “21.8” are to be replaced by “0.32”, “0.30”, “0.26,” and “0.22”, respectively and the unit “g/kWh” is to be replaced by the unit “%vol.”.

Subsubsection: Unburnt hydrocarbons, Page no. 8

- line number 11: The sentence “At full load, the HC emission is 3.3, 3.01, 2.87, and 2.55 g/kWh respectively for D100, D80B20, D70B20P10, and D60B20P20.” is to be replaced by “As compared with neat diesel, a decline of 10%, 20%, and 35%, respectively, was observed in D80B20, D70B20P10, and D60B20P20 at peak engine load.”
- line number 15: The word “CO” is to be replaced by “unburnt hydrocarbon”.
- line number 18: The sentence “thus it shows the lowest UBHC emission among all the fuel samples” is to be replaced by “therefore, UBHC emission was found to be lowest in D60B20P20, compared with other fuel samples”.

Subsubsection: Smoke opacity, Page no. 9

- line number 6: The word “BMEP” is to be replaced by “respect to engine load”.
- line number 15: The data values “8.7”, “13” and “22.7” are to be replaced by “7.3”, “11.7”, and “15.2”, respectively.

Section: Conclusion, Page no. 9

- line number 16: The data value “12.2%” is to be replaced by “8.6%”.

- line number **19**: The sentence “higher premixed combustion” is to be replaced with “lower combustion rate”
- line number **22**: The sentence “In contrast, the NO_x emission was observed to be highest for D100 fuel” is to be replaced by “Therefore, NO_x emission was also observed to be lower in the neat diesel compared with other test fuel blends”.
- line number **24**: The sentence “an overall decrease of up to 23.6% in CO and 22.7% in UBHC emission was observed for test fuel blend containing 20% vol. of WPPO” is to be replaced by “at full load, the decrease of 31.2% in CO and

35% in UBHC emission was observed for test fuel blend containing 20% vol. of WPPO”.

Figures

- “**Fig. 4**”, **Fig. 5**”, “**Fig. 6**”, “**Fig. 7**”, “**Fig. 8**”, “**Fig. 9**”, “**Fig. 10**” and “**Fig. 11**” at page no. 7, 8 and 9 are updated accordingly. Also, in the caption of the Fig. 5,6,7,8,9,10 and 11 the word “BMEP” is to be replaced by “engine load”.

Fig. 4 Variation in ignition probability with surface temperature of hot-plate for different fuel samples

Fig. 5 Variation of brake thermal efficiency with engine load for different fuel samples

Fig. 6 Variation of brake-specific energy consumption with engine load for different fuel samples

Fig. 7 Variation of exhaust gas temperature with engine load for different fuel samples

Fig. 8 Variation of NO_x with engine load for different fuel samples

Fig. 9 Variation of CO with engine load for different fuel samples

Fig. 10 Variation of HC with engine load for different fuel samples

Fig. 11 Variation of smoke opacity with engine load for different fuel samples