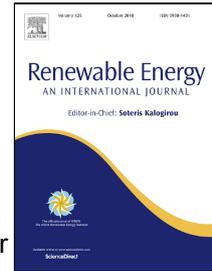


Accepted Manuscript

Combustion of jojoba-oil/diesel blends in a small scale furnace

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PII: S0960-1481(18)30794-8
DOI: 10.1016/j.renene.2018.07.009
Reference: RENE 10283
To appear in: *Renewable Energy*
Received Date: 25 March 2017
Accepted Date: 02 July 2018

Please cite this article as: Salah A.B. Al Omari, Mohammad O. Hamdan, Mohamed YE. Selim, Emad Elnajjar, Combustion of jojoba-oil/diesel blends in a small scale furnace, *Renewable Energy* (2018), doi: 10.1016/j.renene.2018.07.009

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1 **Combustion of jojoba-oil/diesel blends in a small scale furnace**

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7 **Highlights:**

- 8 • Raw jojoba-oil/diesel blends are used as fuel for small furnace.
- 9 • 0 to 35% by weight of jojoba in blends is used with input fuel supply of 8.3 kg/h.
- 10 • Stable flame was possible with 60 % jojoba share if fuel input is 10 kg/ or higher.
- 11 • Jojoba oil in the blend reduces NO_x and unburned hydrocarbon emissions.
- 12 • Jojoba indirectly impacts CO emissions through its effect on the spray processes.
- 13 • Jojoba oil in the blends has adverse impact on thermal radiation to furnace walls.

14 **Abstract:**

15 This experimental study investigates the combustion and pollutants emissions from a small scale
16 furnace burning diesel fuel blended with raw jojoba oil. Jojoba oil to diesel proportions in the
17 blends (on mass basis) ranging from 0 to 35 percent are considered for total blended fuel flow
18 rate of about 8 kg/h. Higher fuel supply rates of about 10 kg/h were needed in order to allow for
19 reaching higher jojoba share in the blends up to about 60 percent. This allows for securing
20 sufficient amount of the higher volatility component (diesel) whose combustion would support
21 the vaporization and subsequent ignition and combustion of the heavier jojoba oil. The presence
22 of jojoba in the blends leads to a clear reduction in NO_x and hydrocarbon (UBHC) emissions but
23 it showed less impact on CO levels. Due to its high viscosity, jojoba in the blends impacts spray
24 formation hence seems to have an indirect detrimental effect on CO emissions. Moreover, jojoba
25 oil in the blends adversely impact thermal radiation to furnace walls due to less sooting tendency

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