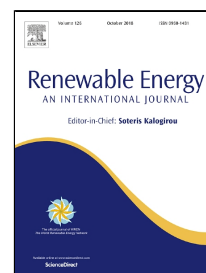


Accepted Manuscript

Co-pyrolysis of cotton stalk and waste tire with a focus on liquid yield quantity and quality

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PII: S0960-1481(18)30690-6
DOI: 10.1016/j.renene.2018.06.045
Reference: RENE 10201
To appear in: *Renewable Energy*
Received Date: 31 December 2017
Accepted Date: 13 June 2018

Please cite this article as: Syed Asfand Yar Shah, Muhammad Zeeshan, Muhammad Zohaib Farooq, Naveed Ahmed, Naseem Iqbal, Co-pyrolysis of cotton stalk and waste tire with a focus on liquid yield quantity and quality, *Renewable Energy* (2018), doi: 10.1016/j.renene.2018.06.045

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1 Co-pyrolysis of cotton stalk and waste tire with a focus on liquid yield quantity and quality

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13 **Abstract:**

14 In this study, effect of waste tire (WT) addition to cotton stalk (CS) pyrolysis is investigated with
15 a focus on liquid co-pyrolysis yield quantity and quality. Various blend ratios (i.e. CS/WT 1:0,
16 4:1, 3:2, 2:3, 0:1) of the two feedstocks were experimented in a fixed bed reactor at 20°C/min
17 heating ramp rate up to 550°C with 50ml/min flowrate of nitrogen as sweeping gas. Blend ratio
18 CS/WT (2:3) showed maximum oil yield (48 wt%) with organic phase (OP) above 78 wt% of the
19 total liquid yield (OP + aqueous phase, AP). OP of CS/WT (2:3) along with those of CS/WT (1:0)
20 and (0:1) were further analyzed qualitatively using analytical techniques including, FTIR, GC-MS,
21 bomb calorimetry and elemental analyzer. Significant increase in carbon and decrease in oxygen
22 content of the CS/WT (2:3) pyrolytic oil was observed which improved its calorific value to
23 41MJ/kg. Among the three OP samples, only CS/WT (2:3) oil showed significant presence of
24 alkanes in GC-MS results, which is, thus, associated with the synergistic effect of the co-pyrolysis

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