

# Accepted Manuscript

Catalytic cracking of biomass tar over char supported nickel catalyst

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PII: S0360-5442(17)32139-4

DOI: [10.1016/j.energy.2017.12.096](https://doi.org/10.1016/j.energy.2017.12.096)

Reference: EGY 12045

To appear in: *Energy*

Received Date: 30 October 2017

Revised Date: 18 December 2017

Accepted Date: 19 December 2017

Please cite this article as: Hu M, Laghari M, Cui B, Xiao B, Zhang B, Guo D, Catalytic cracking of biomass tar over char supported nickel catalyst, *Energy* (2018), doi: 10.1016/j.energy.2017.12.096.

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**1 Catalytic cracking of biomass tar over char supported nickel catalyst**

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**8 Abstract**

9 Catalytic cracking of biomass tar was investigated using steam gasification  
10 obtained char supported nickel catalyst in a lab-scale fixed bed reactor to determine  
11 the effects of catalytic cracking temperature, Ni loading and gas residence time on  
12 product distribution and gas composition. Results showed that the optimum catalytic  
13 cracking parameters were at 800°C catalytic cracking temperature, 6 wt% Ni loading  
14 and 0.5 s gas residence time. The characterizations of tars were determined by  
15 ultimate analysis, FTIR and GC-MS. Compared with no catalyst cracking, the relative  
16 content of single-ring aromatics in tars obviously increases with the appreciably  
17 decreases in polycyclic aromatics, O-containing compounds and heterocyclic  
18 compounds after catalytic cracking, especially in Ni-6/char catalyst condition.  
19 The surface characteristics of Pre- and Post- char supported 6 wt% loading Ni  
20 catalysts were analyzed with BET, SEM, XRD and XPS. The BET and SEM results  
21 indicated that there was a slight deposition of coke on the surface of char after  
22 catalytic cracking. Meanwhile, XRD and XPS results indicated that NiO was  
23 transformed into Ni via carbothermal and hydrogenation reductions which contributed

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