



(<https://www.nationalacademies.org/trb/events>)

A catalytic tar reduction methodology for gaseous fuels

The exploitation of fossil fuels has led to the emerging of gaseous fuel for the automobile engines. The researchers are in the search of producer gas from forest woods. In the process of bio gasification, tar is the major obstacle to produce high efficiency gaseous fuel. In this research work, a catalytic tar mitigation process is framed with nickel (Ni) based catalyst. The Ni based nano Si and Ti catalysts are synthesized using deposition-precipitation method. The synthesized Ni-Si and Ni-Ti catalysts are characterized using scanning electron microscope (SEM) and transmission electron microscope (TEM). The surface area and pore volume are calculated by Brunauer-Emmett-Teller and Barrett-Joyner-Halenda methods to justify the catalytic active surface. A design of experiments (DoE) is framed with L12 design table for the 2 level factors (catalyst, catalyst weight, bed temperature and gas feed rate) for the tar concentration response. The signal to noise (SN) ratio and mean of the factors are analysed to identify the significance. As the outcome of the statistical analysis, it is concluded that the minimum tar concentration of 0.47(mg/Nm³) is attained for the 10% of Ni-Si catalyst with the bed temperature of 800°C and gas feed rate of 0.01 l/s.

Record URL:

<https://doi.org/10.4273/ijvss.11.3.11> (<https://doi.org/10.4273/ijvss.11.3.11>).

Availability:

Find a library where document is available. Order URL: <http://worldcat.org/issn/09753060> (<http://worldcat.org/issn/09753060>).

Supplemental Notes:

© 2019. MechAero Foundation for Technical Research & Education Excellence.

Authors:

Chandrasekaran, M
Subramanian, S Rama

Publication Date: 2019

Language

English

Media Info

Media Type: Web

Pagination: pp 277-280

Serial:

[International Journal of Vehicle Structures and Systems \(/Results?](#)

[q=&serial="International%20Journal%20of%20Vehicle%20Structures%20and%20Systems"\)](#).

Volume: 11

Issue Number: 3

Publisher: MechAero Foundation for Technical Research & Education Excellence

ISSN: 0975-3060

EISSN: 0975-3540

Serial URL: <http://www.maftree.org/eja/index.php/ijvss/index> (<http://www.maftree.org/eja/index.php/ijvss/index>)

Subject/Index Terms

TRT Terms: [Automobiles \(/Results?q=&datein=all&index="Automobiles"\)](#); [Catalysis \(/Results?q=&datein=all&index="Catalysis"\)](#);

[Catalysts \(/Results?q=&datein=all&index="Catalysts"\)](#); [Fuels \(/Results?q=&datein=all&index="Fuels"\)](#); [Gases \(/Results?](#)

[q=&datein=all&index="Gases"\)](#); [Gasification \(/Results?q=&datein=all&index="Gasification"\)](#); [Methodology \(/Results?](#)

[q=&datein=all&index="Methodology"\)](#); [Nickel \(/Results?q=&datein=all&index="Nickel"\)](#); [Tar \(/Results?q=&datein=all&index="Tar"\)](#).

Subject Areas: Highways; Vehicles and Equipment;

Filing Info

Accession Number: 01745830

Record Type: Publication

Files: TRIS

Created Date: (/edit/1680572)Jul 22 2020 2:40PM

The National Academies of Sciences, Engineering, and Medicine

500 Fifth Street, NW | Washington, DC 20001 | T: 202.334.2000 (tel://2023342000).

Copyright © 2025 National Academy of Sciences. All Rights Reserved.

[Terms of Use and Privacy Statement \(http://www.national-academies.org/legal/index.html\)](http://www.national-academies.org/legal/index.html)

[\(http://www.national-academies.org/\)](http://www.national-academies.org/)