Accepted Manuscript

Experimental investigation on the stability and abrasive action of cerium oxide nanoparticles dispersed diesel

S. Balamurugan, V. Sajith

PII: S0360-5442(17)30789-2

DOI: 10.1016/j.energy.2017.05.032

Reference: EGY 10839

To appear in: *Energy*

Received Date: 22 November 2016

Revised Date: 3 May 2017

Accepted Date: 5 May 2017

Please cite this article as: Balamurugan S, Sajith V, Experimental investigation on the stability and abrasive action of cerium oxide nanoparticles dispersed diesel, *Energy* (2017), doi: 10.1016/ j.energy.2017.05.032.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



1	Experimental investigation on the stability and abrasive action of cerium oxide
2	nanoparticles dispersed diesel
3	
4	S. Balamurugan and V.Sajith*
5	Fuels and Combustion Research Laboratory,
6	School of Nano Science and Technology,
7	National Institute of Technology Calicut 673 601, India
8	Contact phone number: 91 495 2286525
9	*Corresponding author Email: sajith@nitc.ac.in
10	

11 ABSTRACT

12 Ceria nanoparticle is a well-known fuel borne additive for reducing the particulate emissions 13 from diesel engines. Main challenges in the use of ceria nanoparticles are the lack of long-term 14 dispersion stability in diesel and their effect on lubricity of diesel. The present work mainly 15 focuses on synthesis of stable ceria nanoparticle diesel suspension and study on their lubricity. 16 Ceria nanoparticles were synthesized by co-precipitation method and nano fluids were prepared 17 by two-step method. The optimum concentration of oleic acid (surfactant) was determined based 18 on critical micelle concentration studies and concentration of ceria nanoparticle in diesel was 19 varied from 5 to 25 ppm. Long term dispersion stability studies using Dynamic light scattering 20 system and Turbidity meter shows 10 ppm as an optimum concentration of ceria nanoparticle in 21 diesel for maximum stability. Tribological properties of modified diesel were studied by a 22 standard pin on disk apparatus. The wear rate was found to be reduced for all the nano additive 23 concentrations in diesel and was least for 15 ppm. Based on studies conducted, 10 ppm is 24 reported as an optimum concentration of nanoparticle in diesel having both enhanced stability 25 and lubricity as compared to other concentration of ceria nanoparticles in diesel.

26

27 Keywords: Cerium oxide nano additives, CMC, Diesel, Long term stability, Pin on disk

- 28
- 29
- 30
- 31

Download English Version:

https://daneshyari.com/en/article/5476763

Download Persian Version:

https://daneshyari.com/article/5476763

Daneshyari.com