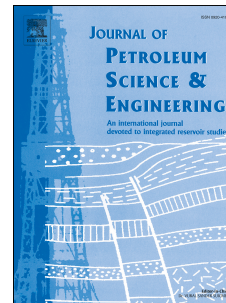


# Accepted Manuscript

Effect of zinc titanate nanoparticles on rheological and filtration properties of water based drilling fluids

Shama Perween, Mukarram Beg, Ravi Shankar, Shivanjali Sharma, Amit Ranjan



PII: S0920-4105(18)30583-7

DOI: [10.1016/j.petrol.2018.07.006](https://doi.org/10.1016/j.petrol.2018.07.006)

Reference: PETROL 5103

To appear in: *Journal of Petroleum Science and Engineering*

Received Date: 16 April 2018

Revised Date: 9 June 2018

Accepted Date: 3 July 2018

Please cite this article as: Perween, S., Beg, M., Shankar, R., Sharma, S., Ranjan, A., Effect of zinc titanate nanoparticles on rheological and filtration properties of water based drilling fluids, *Journal of Petroleum Science and Engineering* (2018), doi: 10.1016/j.petrol.2018.07.006.

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 **Effect of Zinc Titanate Nanoparticles on Rheological and Filtration Properties** 2 **of Water Based Drilling Fluids**

3 Shama Perween<sup>a</sup>, Mukarram Beg<sup>b1</sup>, Ravi Shankar<sup>b2</sup>, Shivanjali Sharma<sup>#b</sup>, Amit Ranjan<sup>\*a</sup>

4 *\*Department of Chemical Engineering, #Department of Petroleum Engineering, Rajiv Gandhi Institute of*  
5 *Petroleum Technology, Jais, 229316, Uttar Pradesh, India*

6 Corresponding authors: aranjan@rgipt.ac.in<sup>\*a</sup>/ssharma@rgipt.ac.in<sup>#b</sup>

## 7 **Abstract**

8 The aim of this work is to evaluate the effect of laboratory synthesized ZnTiO<sub>3</sub> nanoparticles on  
9 rheological and filtration characteristics and their response to heating in a drilling fluid. This  
10 work is the first study where the use of zinc titanate (ZnTiO<sub>3</sub>) nanoparticles is reported to  
11 improve the rheological and filtrate loss properties of water based drilling fluid (WBDF). The  
12 role of nanoparticles is examined by performing a comparative study on drilling fluid properties  
13 by incorporating the ZnTiO<sub>3</sub> nanoparticles from 0.05 to 0.30 w/v% in mud formulations. The  
14 nanoparticles are obtained by two different synthesis approaches: (a) sol-gel bulk polymerization  
15 method (SNP), and (b) sol-electrospinning technique (ENP). These two methods yield  
16 nanoparticles with different mean sizes and size distributions. The experimental work has been  
17 carried out to investigate the influence of concentration of ZnTiO<sub>3</sub> nanoparticles on fluid  
18 rheology at 20°C and 70°C and API filtrate at normal temperature and 100 psi pressure  
19 according to American Petroleum Institute (API) methodology. The mud samples are subjected  
20 to ageing process in hot rolling oven at 110°C for 16 h to study thermal stability and the effect of  
21 ageing on rheological and filtration properties. The experimental results show that ZnTiO<sub>3</sub>  
22 nanoparticles significantly affect the drilling fluid properties and considerably decrease the  
23 filtrate loss and improve thermal stability and rheological properties. Apparent viscosity (AV)

Download English Version:

<https://daneshyari.com/en/article/8124515>

Download Persian Version:

<https://daneshyari.com/article/8124515>

[Daneshyari.com](https://daneshyari.com)