

# Accepted Manuscript

Development a modified crossing point temperature ( $CPT_{HR}$ ) method to assess spontaneous combustion propensity of coal and its chemo-metric analysis

N.K. Mohalik, E. Lester, I.S. Lowndes

PII: S0950-4230(18)30317-6

DOI: [10.1016/j.jlp.2018.09.001](https://doi.org/10.1016/j.jlp.2018.09.001)

Reference: JLPP 3771

To appear in: *Journal of Loss Prevention in the Process Industries*

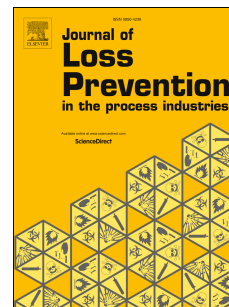
Received Date: 31 March 2018

Revised Date: 8 September 2018

Accepted Date: 9 September 2018

Please cite this article as: Mohalik, N.K., Lester, E., Lowndes, I.S., Development a modified crossing point temperature ( $CPT_{HR}$ ) method to assess spontaneous combustion propensity of coal and its chemo-metric analysis, *Journal of Loss Prevention in the Process Industries* (2018), doi: 10.1016/j.jlp.2018.09.001.

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.



## **Development a Modified Crossing Point Temperature (CPT<sub>HR</sub>) Method to Assess Spontaneous Combustion Propensity of Coal and its Chemo-metric Analysis**

**N. K. Mohalik** <sup>1[0000-0003-1521-432X]</sup> **E. Lester**<sup>2</sup> and **I. S. Lowndes**<sup>2</sup>

Principal Scientist, Mine Ventilation Division, CSIR- CIMFR, Barwa Road, Dhanbad, India

Faculty of Engineering, University of Nottingham, Nottingham, NG7 2RD, UK

niroj.mohalik@gmail.com

**Abstract.** Spontaneous combustion of Indian coals was investigated using sponcomb rig at University of Nottingham, UK to assess their susceptibility. In the present study authors have used eleven coal samples collected from the Jharia coalfield (JCF), India. Both thermal as well as gas profiles from sponcomb rig were studied critically to develop a modified crossing point temperature to assess the spontaneous combustion propensity of coal. The product of combustion gases (CO, CO<sub>2</sub>, CH<sub>4</sub>, and H<sub>2</sub>) emitted from sponcomb rig within the temperature range between ambient and 300 °C of these coal samples were studied. The initial product of combustion gas i.e. CO followed by H<sub>2</sub> indicates spontaneous combustion of coal in laboratory condition for Jharia coalfield. The temperatures at which CO and H<sub>2</sub> releases in the level of 50ppm (T<sub>CO50</sub>, T<sub>H250</sub>), crossing point temperature of coal (CPT<sub>CT</sub>) (temperature of coal and bath temperature is same) and modified crossing point temperature of coal (CPT<sub>HR</sub>) (temperature where dT/dt is equal to 2.0 °Cmin<sup>-1</sup> because heating rate is double of programme temperature 1 °Cmin<sup>-1</sup>) determined from sponcomb rig categorises the coal as per their propensity to spontaneous combustion. The results of these methods have been compared with other standard method i.e. crossing point temperature method – India, which is widely adopted in Indian regulatory bodies to verify the suitability of this method.

**Keywords:** Spontaneous Combustion, Sponcomb Rig, Crossing Point Temperature

Download English Version:

<https://daneshyari.com/en/article/11003051>

Download Persian Version:

<https://daneshyari.com/article/11003051>

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