

96<sup>th</sup>

# INDIAN SCIENCE CONGRESS

ABSTRACTS

YOUNG SCIENTISTS'  
AWARD PROGRAMME

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SHILLONG



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**SHILLONG-2009**

**YOUNG SCIENTISTS' AWARD PROGRAMME**

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## 2. Innovations in Natural Coke Studies

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In Jharia and Raniganj coalfields nearly 3000 million tonnes of coal is baked due to igneous intrusives and underground fires and a part of it is converted into natural coke (Jhama). The heat-affected coals are quite heterogeneous in their physical properties and chemical composition. Due to lack of proper characterization and appropriate technology for mining, this resource was considered colliery waste till recently and has largely remained unutilized.

An effort has been made to characterize these coals employing various analytical techniques such as proximate and ultimate analyses, GCV, SEM, XRD, Real Density and Resistivity testing including Petrography of different washable fractions of natural coke and their blends. The results have been collated to bring forth the possible industrial use of the baked coals and associated rocks with a focus on the genesis of natural coke. Besides, the coal petrographic data was used to formulate a textural, including microstructural, classification scheme for the characterization of natural cokes, which has gained international acceptance. Further, some laboratory experiments, including graphitisation, were carried out to establish the suitability of different fractions of natural coke in different industries such as carbon artifacts, power plants, cement plants and ferro-alloys.

## 3. Centennial Monsoon Changes and its Effect on Global Climate

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Scientific consensus exist that most of the monsoon variability during glacial and interglacial were caused due to Earth's orbital parameter changes. However, high-resolution