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Characterization and application of biomass used in metallurgical sintering operation as a fuel replacement

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The present paper highlights important aspects of sintering process for iron ores, which has been gaining considerable attention over the years. Increasing requirement of steel, depleting sources of iron ore, compositional variations, such as, decreasing Fe content, increased alumina, silica LOI and goethetic content as well as excessive generation of fines are some of the major factors behind growing use of the sintering process. Moreover, with environment policies becoming more stringent all over the world, there is an emphasis on containment of excessive generation of NO_x, SO_x and CO_x gases. Biomass has certain characteristics which makes it a potential alternate and that are, lesser sulphur and ash content, availability in plenty, lower generation time, uniform ignition but for smaller time period, lesser emissive constituents and carbon neutrality. According to literature, a metallurgical sintering operation can optimally replace 20% of coke breeze by biomass without effecting the quality of the product. The objective of the present work is to characterize biomass to find out its suitability and replacement ability in metallurgical sintering operations. Various analytical methods such as macro thermos-gravimetric analysis and micro TG-DTA, FESEM-EDX, FTIR is used to interpret the characteristics which makes it suitable for replacement.

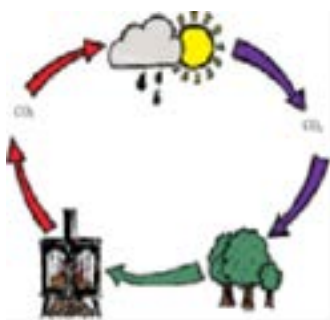


Figure1: Carbon neutrality cycle

Biography

Shatrughan Soren is Assistant Professor in Department of Fuel and Mineral Engineering, Indian Institute of Technology (ISM) Dhanbad, India, working in the field of biomass applications in metallurgical sintering operations. He has keen interest in Iron Ore sintering and pelletization process, so he is trying to synchronize an energy required process with biomass to modify the conventional method. His recently published article (Jha and Soren, 2017) is a detailed review about the work done so far in the field of biomass applications.

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