



Mathematical Modeling for Green Cupola

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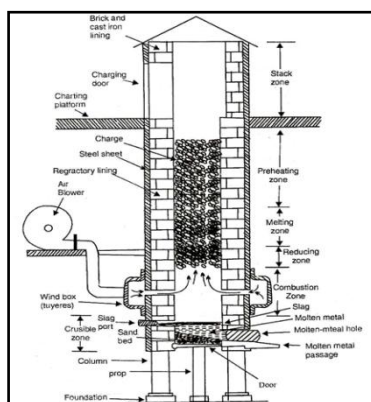
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ABSTRACT

A cupola can be defined as a refractory lined cavity with necessary openings at the top for the escape of the off gasses and charging of the stock, at the bottom for entry of air blast, and drawing off the molten metal and slag. A bed of fuel is laid at the bottom of the cupola, which requires for ignition, following by alternate layers of metal, fuel and flux being charged and blast is then turned on. The cupola is the cheapest iron melting shaft furnace but emitting too much Solid Particulate Matters (SPM), SO_x , NO_x etc. This paper presents the modeling of a new kind of green cupola aiming to reduce the high emission level of SO_x by replacing coke partially or fully with biofuel as well as effective gainful utilization of biowaste.

Graphical Abstract



Greener perspective of using biowaste rice husk with coke in cupola, where followings could be achieved up to certain extent -

- Technical impact – Less SO_x emission
- Commercial – low cost

- Utilization of waste byproduct
Less GHG gas emission

Keywords: Cupola, Induction furnace, Cokeless cupola, Divided Blast Cupola (DBC), SO_x, SPM, Green House Gas (GHG).
