

## EFFECT OF COCONUT SHELL CHARCOAL ON THE PROPERTIES OF BUTHTHALA IRON ORE PELLETS

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Magnetite found in Buththala area is an iron oxide rich iron ore. It has a purity of 98 % which is nearly gangue mineral free. Due to this purity of Buththala iron ore it is not required to perform ore preparation. Therefore, powder can be made directly from iron ore and it can be used for pelletizing. Objective of this project was extracting iron from Buththala iron ore using a locally available coconut shell charcoal, a reducing agent where proportions required for optimum extraction was not known for this ore. In this project,, optimization of coconut shell charcoal content of Buththala iron ore pellets was done. The pelletizing is done using a mixture of lime (CaO), coconut shell charcoal and magnetite. The optimized lime content used was 2 parts for 100 parts of Magnetite. Pellets were made altering the charcoal content from 4,5,6,7,8 to 9 parts of charcoal for 100 parts of Magnetite. Moisture content required was approximately between 7- 10 %. Then combinations were tested to find the optimum charcoal content by measuring following variables; sintering temperature, compression strength, apparent porosity and maximum weight reduction. Required compression strength was given only by pellets sintering in muffle furnace at 1350°C. Therefore pellets those are sintered at 1350°C could be used for further testing. Apparent porosity was in an acceptable level between 25 % - 30 %. Pellets which showed the highest early weight reduction was taken as best early weight reduction. The pellets containing 5 parts of charcoal for 100 parts of magnetite and sintered at 1350°C showed the best early reducibility (5.1 %). Compression strength higher than 300 kgF and apparent porosity between 25 % - 30 % was also at acceptable level. Therefore, the optimized charcoal content was 5 parts of charcoal for 100 parts of magnetite and the optimum sintering temperature was 1350°C for Magnetite found in Buththala.

**Keywords:** Buththala, Coconut shell charcoal, Iron ore, Pellets