Beneficiation of Non-Coking Coal for Generating Low Ash Clean Coal

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ABSTRACT

The rapid upsurge in India's electricity demand with passage of time is consensual perception among energy planners and coal certainly will occupy the centre stage in driving the growth momentum of the country's economy at macro-economic level. 80% Consumption of non-coking coal is attributable to power sector and India's definitive coal reserves is estimated to be around 93 billion tonnes (source: Ministry of Coal), and with focussed scientific exploitation of the same, it is adept in catering to energy generation requirement of the country, spanning over next 5-6 decades. However, Indian coal has been observed to be of low quality on account of its high ash content attribute and non-coking category coal constitutes sizeable quantity of near-gravity materials (NGM), which entails beneficiation to suit end-user. The beneficiated coal has immense potential for being used as a blendable mix for metallurgical applications and such blend formulation of clean coal facilitates maximising the infusion of non-coking coal with scarce coking coal for catering to metallurgical industries, enabling lesser dependence on import of high-rank low ash content coke. The present manuscript is aimed at generating low ash (10%) clean coal from high ash (28.88%) non coking coal. The coal was characterised thoroughly in terms of petrography characteristics, size analysis, washability and chemical composition and the gross calorific value of the coal was observed to be 5327 Kcal/kg. The processing was initiated at a top size of 12.5 mm and efforts were made to achieve the objective of 10% ash level in the clean coal at the coarsest possible size adopting advanced gravity based techniques. Tactical combination of gravity separation and flotation techniques yielded clean coal (10% ash content) with maximum possible produce and results were discussed in light of experimental details.

Keywords: *Non-coking coal, Beneficiation, Washability, Gravity separation, Flotation*