

# Processing Nigerian coal deposits for energy source

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## Abstract

Some coal deposits in Nigeria were assessed through geochemical Rock Eval pyrolysis, organic petrology and combustibility studies to characterize them and to determine their suitability as an energy source. The following correlations were obtained. Rock Eval hydrogen indices (HI) correlate proportionally with the petrographical liptinite content; oxygen indices (OI) correlate proportionally with the combustibility time and with the petrographical inertinite content (made up mainly of fusinite). The coals with higher values of OI correlating with high inertinite content produce more visible smoke during combustion, while those with lower OI and higher liptinite content produce less visible smoke (smoke perception). The Okaba coal deposits in the Northern Anambra Basin contain higher values of HI, lowest values of OI and inertinite content and correspondingly had the shortest combustibility time. It also has very little visible smoke and assumed to be the most suitable for smokeless fuel production and electrical energy generation. Using these parameters to characterize the other coals, the Owukpa and Omelehu come next as a good coal energy source. The Ogboyaga coals have relatively high OI and inertinite contents; it produced the most visible smoke. The Lafia-Obi coals with high inertinite content took the longest time to bring the same volume of water to boiling point, compared to the other coals. Defusination experiments in which samples were digested with eight types of organic acids gave results that show that Benzoic and Formic acids can be used to clean the coals (to some extent) to make them more suitable as environmental-friendly energy source.

**Keywords** Coal processing · Energy source · Rock Eval · Deforestation · Climate change