

Production of Ashless Biomass through Solvent Extraction for Coal-Biomass Co-firing

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The idea of substituting coal to biomass in coal-fired power plants is highly considered as a fast-track to overcome global warming as it is a near-term, low-risk, and sustainable option. Many countries have successfully demonstrated coal-biomass co-firing activities in their coal-fired power plants. However, due to the nature of biomass, mainly because of ash content with a low melting point, its exploitation as secondary fuel in co-firing is only technically and economically acceptable in the range of 5 to 10% w/w. In this study, solvent extraction as a treatment for biomass demineralization was investigated. The objective of the study is to eliminate mineral content in biomass making a bigger share of its utilization for co-firing purpose feasible. A woody biomass was extracted by non-polar organic solvent 1-methylnaphtalene (1-MN) at 350°C for 1 hour to produce ashless biomass. The result shows that the process is effective to eliminate almost all of the minerals. Among variations, biomass torrefaction at 300°C, as a pretreatment process, was observed to be an optimum condition to obtain the highest extraction yield.