JEP> Vol.3 No.7, July 2012

OPEN ACCESS

# An Evaluation on the Physical and Chemical Composition of Coal Combustion Ash and Its Co-Placement with Coal-Mine Waste Rock

PDF (Size:851KB) PP. 589-596 DOI: 10.4236/jep.2012.37071

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## ABSTRACT

In the last few decades, the utilization of coal to generate electricity was rapidly increasing. Consequently, the production of coal combustion ash (CCA) as a by-product of coal utilization as primary energy sources was increased. The physical and geochemical characteristics of CCA were site-specific which determined by both inherent coal-source quality and combustion condition. This study was intended to characterize the physical, chemical and mineralogical properties of a coal-combustion ash (CCA) from a site specific power plant and evaluate the leachate characteristic of some scenario on the co-placement of CCA with coal-mine waste rock. The physical properties such as specific gravity, dry density, porosity and particle size distribution were determined. Chemically, the CCA sample is enriched mainly in silica, aluminum, iron, and magnesium along with a little amount of calcium and sodium which includes in the class C fly ash category. Moreover, it is found that the mineral phases identified in the sample were quartz, mullite, aragonite, magnetite, hematite, and spinel. Co-placement experiment with mudstone waste rock shows that the CCA, though it has limited contribution to the decreasing permeability, has important contributed to increase the quality of leachate through releasing higher alkalinity. Moreover, addition of CCA did not affect to the increase of the trace metal element in the leachate. Hence, utilization of CCA by co-placement with coal mine waste rock in the dumping area is visible to be implemented.

## KEYWORDS

Coal Combustion Ash; Characteristic; Co-Placement; Sulfidic Waste Rock

## Cite this paper

G. J. Kusuma, H. Shimada, T. Sasaoka, K. Matsui, C. Nugraha, R. S. Gautama and B. Sulistianto, "An Evaluation on the Physical and Chemical Composition of Coal Combustion Ash and Its Co-Placement with Coal-Mine Waste Rock," *Journal of Environmental Protection*, Vol. 3 No. 7, 2012, pp. 589-596. doi: 10.4236/jep.2012.37071.

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