

Definition of mineral and chemical composition of fly ash derived from CFB combustion of coal with biomass

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ABSTRACT

The chemical and mineralogical composition of fly ash derived from the circulated fluidised bed combustion of Greek lignite, polish coal and wood chips was investigated in this paper. The characterisation study of the fly ash has been accomplished through chemical analysis (XFR and ICP), particle size distribution, X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM). The results obtained show that the chemical composition of the produced fly ashes depends on the used fuel blends; in consequence the fly ashes contain a high concentration of CaO. Moreover, SiO₂ is the dominant oxide with Al₂O₃ and Fe₂O₃ detected in considerable quantities. Finally, results obtained by XRD show that the major mineral phase of fly ashes is quartz, while other mineral phases that are contained are maghemite, hematite, periclase, rutile, ghelenite and anhydrite, which were also identified by the Scanning Electron Microscopy (SEM). The evaluation of the above results will be used in order to investigate the potential uses of CFB fly ash.

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