

Physic-Chemical Characteristics of European Pulverized Coal Combustion Fly Ashes

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ABSTRACT

This work focuses on the study of around 30 fly ashes from pulverised coal-fired power plants originating from different European countries (The Netherlands, Italy, Greece, Spain and UK). This range of pulverized coal combustion fly ashes that have very different compositions, was selected in view of determining the suitability for different applications and further study on such applications. The research mainly focuses on parameters governing the applications for extraction of silica and for zeolitisation but, the results may also serve to evaluate suitability for many other potential applications. Major characteristics investigated were, major and trace element content, mineralogical composition, physical parameters (such as grain size, porosity, density and morphology), leaching properties and leachability of major and trace elements. Two of the most interesting results obtained are: a) the determination of the glass composition of around 20 fly ashes, b) the finding of a general rule that controls the glass content of EU fly ashes according the Si/Al rate in glass ($\text{SiO}_2/\text{Al}_2\text{O}_3 = -0,0509\text{Glassin \%} + 6,26$, $R^2 = 0,74$).