

Application of wood waste ash in concrete making: revisited

ABSTRACT

Portland cement production is a carbon dioxide trigger responsible for almost 5% of the world's CO₂ emissions. Pozzolanic inclusions could contribute to sustainability particularly if they are derived from waste. Managing solid waste is increasingly becoming a global challenge as a result of increasing volume of accumulated waste from industrial and agricultural by-products. Environmental concerns as well as economic implications related with disposal of these wastes have prompted many researchers in order to provide viable solutions. Recycling of these waste materials into the construction industry seems to be a more promising and viable alternative most especially in the manufacturing of greener and sustainable concrete material. Wood ash (WA) is a by-product derived from incineration of wood as well as its products such as sawdust, wood bark and chips. This paper presents an overview on investigations performed on the applicability of this material in mortar and concrete making. Specifics on physical, chemical, mineralogical and elemental characteristics of the waste material are discussed. It highlights the impact of wood ash on workability, compressive and flexure strengths, water absorption, drying shrinkage, carbonation, alkali-silica reaction (ASR) and chloride permeability of concrete.

Keyword: Concrete; Recycling; Wood ash; Mechanical properties; Durability; Supplementary cementitious material