

ABSTRACT

In Pakistan, the cement manufacturing industries are flourishing. The emission of CO₂ arises the question of the mass production of cement for long-lasting sustainability and ecological viewpoints. The energy-efficient and environmentally friendly materials are needed which can be blended with cement. Thus, the exploration of such materials from local sources is required. This investigation emphasises on the development of such materials and termed as cement replacing materials (CRMs). The project comprises five materials fly ash, rice husk, bagasse ash, fuller's earth, and sawdust ash. This project focuses mainly on the characterization of materials through spectroscopic tests like X-Ray Fluorescence, X-Ray Diffraction, Thermo Gravimetric Analysis, Scanning Electron Microscope. The key points for establishing the processes are the optimised use of energy, minimize the environmental hazards, and easy to be adopted in mass production. The optimum use of developed CRMs for a better quality of concrete blended with cement has been explored. The key target for the better quality of concrete is an improvement in mechanical properties and early age strength gain which is important for a practical point of view.