

Temperature effect on engineering properties of fly ash

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ABSTRACT

Introduction: Cement is one of the most important & costly material in civil engineering. On the other hand, fly ash is fine particles of aluminosilicate glass, resulting from combustion of coal in electric generating plant which pollutes the environment and are recently used in concrete to substitute cement. When these glassy particles contact water and calcium hydroxide, they react to form an amorphous calcium aluminosilicate hydrate gel, which binds aggregate particles together. This is defined as pozzolanic.

In the present study the temperature effect on physical & engineering properties of fly ash is analysed. When fly ash is treated at a particular temperature for certain time in specific atmosphere, the physical properties of fly ash like the color, particle size & particle size distribution changes, which can be useful in cement concrete.

Materials: fly ash, cement, water, sand,

Methods: Atomic Force Microscopy, X- ray Photo electron Spectroscopy, Young's modulus by nanoindentation method, Sieve analysis, compressive strength testing machine, vicat apparatus.

Result: The results of our experiments shows a decrease in particle size of fly ash & slightly change in colour. Its binding properties is also improved. This is helpful to replace more amount of cement in concrete, reduce the unit cost of concrete and enhance the engineering properties of fresh concrete and hardened concrete like its workability, water absorption and compressive strength etc.

Conclusion: With the results of our experiments we propose that more cement could be replaced by fly ash. Cement production have adverse effects on environment and fly ash is itself a pollutant. Which means we can save environment by reduce the use of cement by replace with a waste material like fly ash.