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Formulation of the cement kiln dust (CKD) in concrete: Studies of the physical-chemical and mechanical properties

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Abstract : This present work aims to valorize a solid waste produced by the cement kiln,such asthe cement kiln dust (CKD) generated from the cement plant of Amran - Yemen during the production of cement.Which we substituted the clinker (cement) by the weight of it at different percentage to achieve the following objectives:
*Minimize the emission of CO_2 into the atmosphere which is the main cause of the greenhouse effect and reduce the solid waste "cement kiln dust (CKD)" that were generated by the cement kiln during the production,while elaborating a new hydraulic binder friend of the environment;
*Gain a percentage of energy and raw material consumed.
In this paper, the possibility of using the cement kiln dust (CKD) as an addition in the production of cement and concrete has been studied. We studied the effect of adding of CKD on the physical-chemical characteristics as well as its influence on the physical properties of cement-based of CKDon one hand. In addition the effect of the CKD on the compression strength mechanical has been studied on the other hand.
The obtained results showed that the solid waste (CKD) and the emissions of CO_2were reduced according to the use of the percentage of cement kiln dust in the formulation matrix. The fineness by sieving and by the Blaine Specific Surface Area (BSSA) augmentedwhin the percentage of adding CKD also increases. The quantity mixing water is growing in function of the increase in the percentage of addition of CKD in cement. In more expansion rises when the content of the CKD increases. The setting time increases with the increased of the percentage of the CKD also. Similarly, the mechanical strengths at 2/7 and 28 decrease with the percentage of cement kiln dust in cement was augmented.
Key words : Greenhouse gas, cement kiln dust, composite cement, new formulation, physical-chemical characteristics, mechanical strength.

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