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Eco-Con, the environmental impact evaluation and testing of sustainable inorganic binders: A green alternative to ordinary Portland cement

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Due to the current increase in environmental awareness and hence the need for sustainable development, it is important to introduce more environmental and sustainable construction materials into the construction industry. Sustainable construction materials should not only be environmental friendly but also provide high level of safety and cost effectiveness over the long term. Sustainable construction materials should be proposed and introduced into the construction industry mostly to replace cement. Cement is one of the most commonly used construction materials with very high carbon emissions. Therefore, this study focuses on the sustainable alternative constituents to cement. Low grade magnesium oxide (LGMgO), pulverized fuel ash, steel slag and hydrated lime are the materials proposed as cement replacement. The physical and chemical characteristics of materials in discussion are investigated and the results are demonstrated in this study. Accordingly, LGMgO and steel slag are found to be an effective cement replacement material at different ratios. LGMgO and steel slag both have similar hydration characteristics as cement. Strength development continues at longer curing ages and LGMgO is reactive enough when in contact with water to produce hydration reactions and products that are required for strength development. The compressive strength development of LGMgO and steel slag is promising that these materials can replace cement and be effectively used in many civil engineering applications. The findings highlighted the environmental and economic potential of replacing cement and other binding materials with LGMgO and steel slag.

Biography

Beste Cubukcuoglu has completed her PhD in year 2012 at University of Surrey, UK. She is currently working at Antalya International University as the coordinator of Civil Engineering Department ERASMUS exchange program and full time Lecturer. She has written a number of papers, exhibited many posters and held a number of presentations about her research findings at various conferences worldwide. She has been serving as an Editorial Board Member and experienced reviewer of many reputed journals.

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