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Stabilization of Medical Waste Ash in Mortar Mixes

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Abstract: There is a growing environmental concern in many countries around the world from the accumulation of solid waste glass since not all glass can be recycled into new glass. This study explores the recycling of solid waste glass in concrete mixtures to reduce the environmental pollution and to improve the properties of concrete material. Three waste glass powder (WGP) levels were considered in this study: 5%, 10% and 15%. The properties investigated include: setting time, workability, compressive and flexural strength and micro-structure of mortar. The mortar mixtures proportions were 1:3:0.7 by weight for cement, sand and water, respectively. The results showed that the solid waste glass can be recycled in cement concrete mixtures and improve the properties of concrete. The setting time of cement paste increased and the workability decreased with the increase of the WGP content. The compressive strength of mortar increased with the increase of WGP as partial replacement of limestone sand under moist curing. The flexural strength of mortar increased with the increase of WGP as partial replacement of by cement or sand under moist curing. The autoclaved WGP mortar showed higher compressive strength and lower flexural strength compared to the moist cured mortar. The scanning electron microscopy images showed that WGP material is good filler because it reduced the porosity of mortar .