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EFFECT OF PARTICLES SIZE OF CRT GLASS WASTE ON PROPERTIES OF POLYMER CONCRETES

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Abstract

The research has been focused on concretes in which the continuous phase is some kind of polymeric resin and the discrete phase is some type of mineral aggregate. Such composite materials are known as Polymer concretes (PC) and boast several advantages such as lower weights, higher resistance to corrosive environments and chemical attacks, faster curing and lower permeabilities. In PC the inorganic fraction can reach up to 90% of the total and is made up of aggregates such as sand and gravel. The aim of this work is to study how to use glass waste CRT to replace sand and gravel, from to made a recycled glass polymer concretes. In particular it has been investigated the effect of particle size distribution of CRT recycled glass on properties of PC obtained. The first step is the chemical/physical characterization of recycling materials through XRF, XRD, particle size and microstructural analysis (SEM). This is followed by the realization and optimization of laboratory prototypes prepared with glass wastes and unsaturated polyester resin. The performances of material have been evaluated with different tests: microstructural analysis (SEM, packing factor), chemical/physical analysis (chemical resistance, water adsorption), and mechanical analysis (bending test, impact test, scratch test). The results obtained showed how it is possible to obtain a concrete polymer composed only of recycled glass. The results also showed the structural limits of the materials obtained allowing the relative percentages between coarse and fine fractions of glass to use to achieve PC with recycled glass.

Key words: glass waste, polymer concrete, recycling, unsaturated polyester

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