

Curing Characteristics of Cement Pastes Modified by an Epoxy Resin

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ABSTRACT: Curing characteristics of epoxy modified cement pastes prepared at different polymer content (0-18) weight percentage and at constant water/cement ratio of 0.3 were investigated. The study included initial and final times of setting tests and thermal analysis using Differential Scanning Calorimetry (DSC) technique. The setting time test confirmed that the polymer act as a set retarded. DSC data revealed interesting information regarding the influence of polymer on cement hydration. Several curing parameters were determined from the DSC thermograms such as the initial, optimum and final curing temperatures, curing energy and rate of curing. The curing characteristics of the modified mixes were compared with plain cement paste in the investigation reported herein.

1. INTRODUCTION

The concept of the use of polymers in concrete is not new. The available literature of interest dates back to 1940s (1). Modified cement pastes, mortars and concretes were developed using lattices (2), liquid resins (3) and water soluble polymers (4). It is well known that when cement comes into contact with water, its components react and different hydration products are formed. Out of these calcium silicates are the most important constituents(5).

There are two proposed theories for the action of polymers in concrete. According to the first theory there is no interaction between the polymer and concrete, as the available