

Characteristics of the Capillary Absorption and Permeability of Water in Mortar and Polymer Modified Mortars

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ABSTRACT: Characteristics of the capillary absorption and permeability of water in mortar and polymer modified mortars based on epoxy and unsaturated polyester resins were determined according to standard procedures. The polymer content of the composites was 10 (weight %), and water/cement ratio was 0.6. The cumulative capillary absorption of the mortars were found to increase with temperature. The modified mortars possessed lower capillary absorption characteristics (sorptivity and intrinsic sorptivity) and higher activation energies with values depending on the binding tendency of the resins compared to that of the conventional mortar. The permeability results demonstrated clearly the reduction of mortars permeability via incorporation of polymers in the mix.

1. INTRODUCTION

It has been demonstrated in many laboratory and field studies that water absorption and permeability gives a great problem in environmental stability of construction structures⁽¹⁾. The great majority of structures are exposed to moist air, and if the relative humidity is high then over a period of time the strength of the structures usually declines. The absorbed water freezes in concrete pores at cold climate, its volume expands and causes stresses. In addition to that when moisture and air penetrate the reinforced concrete, corrosion of the reinforcement materials may take place, and when