

Thermal Properties of (Epoxy – Novolac) Polymer Modified Concrete

I. M. Kamal**, F. M. Falih* and A. Ahmed*

** Chemical Engineering Department

* Civil Engineering Department

College of Engineering

Basrah University

Basrah-Iraq.

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ABSTRACT

Thermal conductivity characteristics and effect of high temperature exposure on compressive strength of concrete and polymer modified concrete mixes based on different weight percentage (0, 3, 6, 9, 12 and 15) of epoxy–Novolac resin were examined. The results obtained confirmed that thermal conductivity coefficient of the prepared PMCs decreased with increasing P/C ratio and with increasing the test temperature. The investigation concerning the effect of high temperature exposure revealed that compressive strength of conventional concrete decreased with increasing temperature, but incorporation of (Epoxy – Novolac) resin in the concrete mix caused some recovery in compressive strength up to 200 oC. Heating the mixes at elevated temperatures above 200 oC caused deterioration in compressive strength, which may be attributed to effect of heat on both concrete components and the polymer.

INTRODUCTION

Polymer modified concrete is a premixed material in which either a monomer or a polymer is added to a fresh concrete mixture in a liquid, powdery, dispersed phase and subsequently allowed to cure. (1,2,3)

The major benefits of polymer modified concrete its improved durability (4) and better adhesion

characteristics (5) in addition to good mechanical performance (6) compared to conventional concrete. Typical uses are overlays for bridge decks and in prefabricated masonry curtain wall panels, parking garage and floors (7).

Although the thermal properties of concrete not necessarily related to durability, thermal properties of concrete affect its performance over