

## *Phenol-Formaldehyde Modified Cement Concrete*

I.M. Kamal\*, M.J. K. Essa\*\* and S.A. Niema\*\*\*

\* *Assistant Prof., Chemical Eng. Dept., College of Eng.*

\*\* *Lecturer, Civil Eng. Dept., College of Eng.*

\*\*\* *Lecturer, Chemical Eng. Dept., College of Eng.  
Basrah University, Basrah-Iraq.*

**ABSTRACT.** Polymer-cement concrete composites containing (0-15) weight percent phenol formaldehyde resin were prepared and tested for; setting time, mechanical and water permeability characteristics. The results of standard consistency for polymer cement specimens prepared with different water/cement ratios indicated that the ideal water/cement ratio was 22%. The resin acts as a water reducing admixture that it improves the workability and enables lower water/cement ratio to be used. The effects of resin content and curing temperature on mechanical properties were studied. The polymer concrete specimens content of 10% and cured at room temperature, developed the maximum outstanding mechanical properties. Water permeability study proved that the prepared polymer concrete specimens are water proof compared with plain concrete.

### INTRODUCTION

Cement and concrete are among the most important building and construction materials, because of its comparative cheapness and easiness to make, fire proof and water tight cement-based products possess excellent compressive strength, but their flexural, tensile and impact strength are limited. These deficiencies have historically eliminate Portland cement material from consideration for use in thin coating or in marine constructions, where the erosion of concrete is always very serious.

Over the years, considerable studies have been carried out in the field of polymer concrete as the improved construction material an important one had been carried out by Scarlon(1981). Improvement in properties such as adhesional bond strength, fracture toughness, impermeability, abrasion resistance and workability can be obtained by polymer addition thus superior composite