

Improving the Mechanical Properties and Resistance to High Temperature of Concrete by Adding Styrene Butadiene Rubber (SBR) Polymer

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This research includes the study of improving mechanical properties and resistance to high temperature of concrete using styrene butadiene rubber (SBR) with different weight ratios of polymer to cement (3%,5% and 10%). Two series of polymer modified concrete (PMC) were produced the first (level I) with moderate compressive strength and the other (level II) with higher compressive strength.

The Specimens which are used in this study are as follows:

Ninety-six (100X100X100 mm) cubes for compressive strength tests, forty-eight (100X100X500mm) prisms for flexural strength (modulus of rupture), forty-eight (50X50X50 mm) cubes for high temperature tests, Results showed an improvement in all properties of polymer modified concrete (PMC) over reference concrete. In compressive strength the increase was (7.14%-28.79%) for PH10 and PM5 mixes. In flexural strength the maximum increase was (26.64%) for PH10 mix.

In the effect of high temperature on concrete tests, PMC (level I) specimens with moderate compressive strength gained a compressive strength greater than reference concrete specimens up to 475 Co. PMC (level II) specimens with higher compressive strength gained a compressive strength greater than reference concrete specimens up to 625Co.