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MODIFICATION OF POLYPROPYLENE FIBERS BY GRAFT COPOLYMERIZATION OF METHACRYLIC ACID MONOMERS FOR REINFORCING OF CONCRETE

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One of the disadvantages of concrete is its defect in tensile tension. This deflection can be partly solved by introducing proper fibers to concrete. Suitable fibers bridge between microcracks on concrete and don't allow them to propagate. Amount of improvements in concrete properties, highly depends on interfacial bond between concrete and the fibers. The stronger bond, results the better improvements in concrete properties. Polypropylene fibers are stable in alkaline environment of the concrete and usage of them for reinforcing of concrete is economical, but pp-fibers are hydrophobic and this characteristic makes two problems. First, dispersion of the fibers in cementitious matrix is not uniform and the second, because of the lack of polar groups, fibers can't chemically bond to the matrix. To solve these problems, surface modification of pp-fibers is suggested. Grafting of pp-fibers with methacrylic acid (MAA) monomers is used as one of the surface modification methods. Chemical reactions were confirmed by The FTIR results and MAA grafted pp-fibers show better bond to cementitious matrix as pull out test and SEM graphs confirm it. Influence of grafting degree on tensile strength and flexural strength of concrete were investigated and compared with reinforced concrete with unmodified pp-fibers.