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Properties of Bacterial-based Self-healing Concrete- A review

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Abstract: The phenomenon formation of micro-cracks in concrete is common, this leads to costly maintenance. Concrete needs to be repaired. This causes degradation of concrete leads to ingress of deterious substances into concrete, results in deterioration of structures. To overcome these situations self-healing techniques are adopted. By the addition of urease producing bacteria along with calcium source results in calcite precipitation in concrete. Bio-mineralization techniques give favorable results in sealing the micro-cracks in concrete. The freshly formed micro-cracks can be sealed up by continuous hydration process in concrete. The ureolytic bacteria i.e., bacillus pasteurii which can produce urea is added along with the healing agent to seal the freshly formed micro-cracks by $CaCo_3$ precipitation. For the improvement of pore structure in concrete the bacterial concentrations were optimized for better results. Increase of durability, compressive strength and reduction of permeability in concrete is attained. Ability to heal and seal the cracks in concrete was observed. Maintaining pH under favorable conditions, permeability of concrete, crack healing capacity of concrete was observed.

Keywords: Self-healing, Micro-cracks, Ca Co_3 precipitation, Bacteria, Hydration, Bacillus pasteurii.

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