

Abstract Details

Title: Bio-Concrete: The Future of Concrete Science

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Abstract: In modern construction era, concrete has become a very important construction material and also with the name concrete, it is a very well-known fact that the structures made with concrete are very prone to cracking due to a number of reasons, which allows moisture and other chemicals to enter the concrete surface leading to degradation, reducing the performance of structure, which sometimes even requires a very expensive repairing cost. As cracking in concrete mainly affects the durability, as these cracks are generally responsible for the movement of liquid and gaseous substances through the surface probably containing the deleterious substances and with the timely growth of these cracks, they not only damages the concrete but also leads to the exposure of moisture and oxygen, sometimes chlorides and carbon dioxide as well to the reinforcement of the structure causing corrosion, such micro cracks are most important factor responsible for the failure of structures, So overcome these issues, a new mechanism of self-healing is introduced by adding bacteria in the concrete. Currently at most places synthetic polymers such as epoxy treatment are used for repairing the concrete but on the other sides such epoxy treatments are very harmful to the environment. That's why the use of such biological repairing technique in concrete is focused. The remedy of such disappointing issues created because of breaks and crevices, an approach of using bio mineralization or adding bacteria to the concrete comes into the place lately. In this technique of improving the properties of concrete, the calcite encouraging spore shaping microscopic organisms are brought into concrete and when moisture enters the crack, it initially responds with the added bacteria causing the structure encouraging calcium carbonate, as a result, which fills the splits and makes the surface split free concrete. An overview of development of bioengineered concrete using bacterial strain *Bacillus subtilis* JC3 are studied in this paper.

Keywords: Bacterial concrete, *bacillus subtilis*, self-healing, bio mineralization.