Modeling Microbially Induced Concrete Corrosion in Sewers

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The state of urban infrastructure systems has become a problem worldwide because of the cost of expansion and maintenance. The wastewater collection system is a major portion of that infrastructure. A failure in the wastewater collection system can lead to health problems and property damage, so efforts must be made to insure the integrity of the sewer system.

Microbially Induced Concrete Corrosion (MICC) is the process where biogenic sulfuric acid reacts with cementitious material to deteriorate the integrity of concrete pipe and other structures. Research is currently underway at the University of Houston to examine the processes involved in the MICC process. Since its first discovery in 1945, many studies have been conducted on MICC, but none look at the process in its entirety. Studies at the University of Houston are looking at all aspects of the corrosion process from sulfide production to sulfate-concrete interactions.

A model is being developed to describe the processes involved in MICC. This model will integrate currently available information and partial models as well as developing a total concept model. Laboratory experiments are being conducted to determine information that is not available from literature. The final model will be useful to predict MICC for various types of concrete under different environmental conditions.

Conceptual Model and Factors in the MICC Process