

## **Use of Accelerated Calcite Precipitation (ACP) to Investigate a Clogging Potential of Recycled Concrete Aggregate (RCA)**

Jinwoo An<sup>1)</sup>, and \*Boo Hyun Nam<sup>2, 3)</sup>

<sup>1)</sup> *Department of Civil and Mechanical Engineering, The School of Engineering, University of Mount Union, Ohio, U.S.A*

<sup>2)</sup> *Department of Civil Engineering, Kyung Hee University, Republic of Korea*  
<sup>2)</sup> [boohyun.nam@khu.ac.kr](mailto:boohyun.nam@khu.ac.kr)

<sup>3)</sup> *Department of Civil, Environmental, and Construction Engineering, University of Central Florida, Florida, U.S.A*

### **ABSTRACT**

It has been reported calcite precipitation from recycled concrete aggregate (RCA) can be a cause of clogging in its drainage applications. The accelerated calcite precipitation (ACP) procedure has been devised to evaluate the long-term geochemical performance of recycled concrete in subsurface drainage systems. While the procedure was useful for the French Drain application, there remained opportunities for improvement. In this study, the prototype ACP method has been enhanced. The effects of temperature and time on reactions were evaluated, and the optimum temperature and time to maximize the calcite precipitation are selected. The improved method was then applied to limestone and RCA samples (with different weathering conditions) from different sources, that were graded for Type I Underdrain application, to compare the calcite precipitation. Two key findings are (1) that calcite precipitation can be maximized by decreasing the heating temperature and increasing the heating time, and (2) the potential for calcite precipitation from RCA is not as significant as for limestone. With the enhanced ACP method, the total amount of calcite precipitation from RCAs within life cycle of a drain system can be determined when RCA is used as pipe backfill materials in a drain system.

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<sup>1)</sup> Professor

<sup>2)</sup> Professor

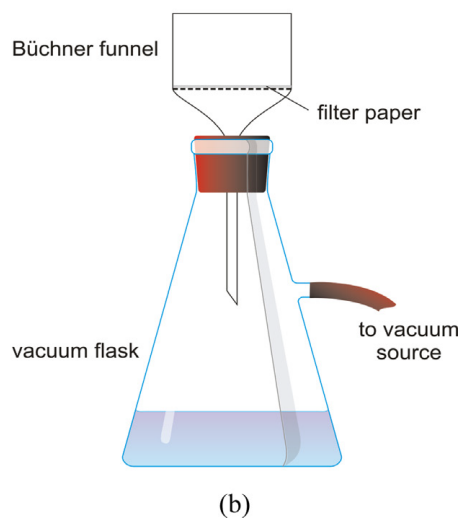


Fig. 1 filtration equipment required for ASTM D5907

## REFERENCES

- McCulloch, T., Kang, D., Shamet, R., Lee, S. J., Nam, B. H. (2017). "Long-term performance of Recycled Concrete Aggregate for subsurface drainage," *Journal of Performance of Constructed Facilities*, Volume 31, Issue 4, DOI 10.1061/(ASCE)CF.1943-5509.0000994.