

## SUPPLEMENTAL MATERIALS

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# Reductions in Hydraulic Conductivity of Sands Caused by Microbially Induced Calcium Carbonate Precipitation

Seung-Hun Baek, Tae-Hyuk Kwon, and Jason T. DeJong

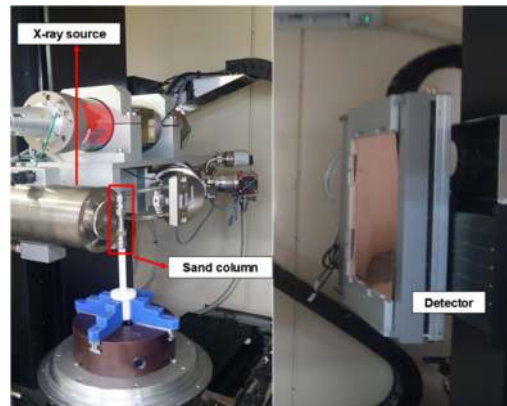
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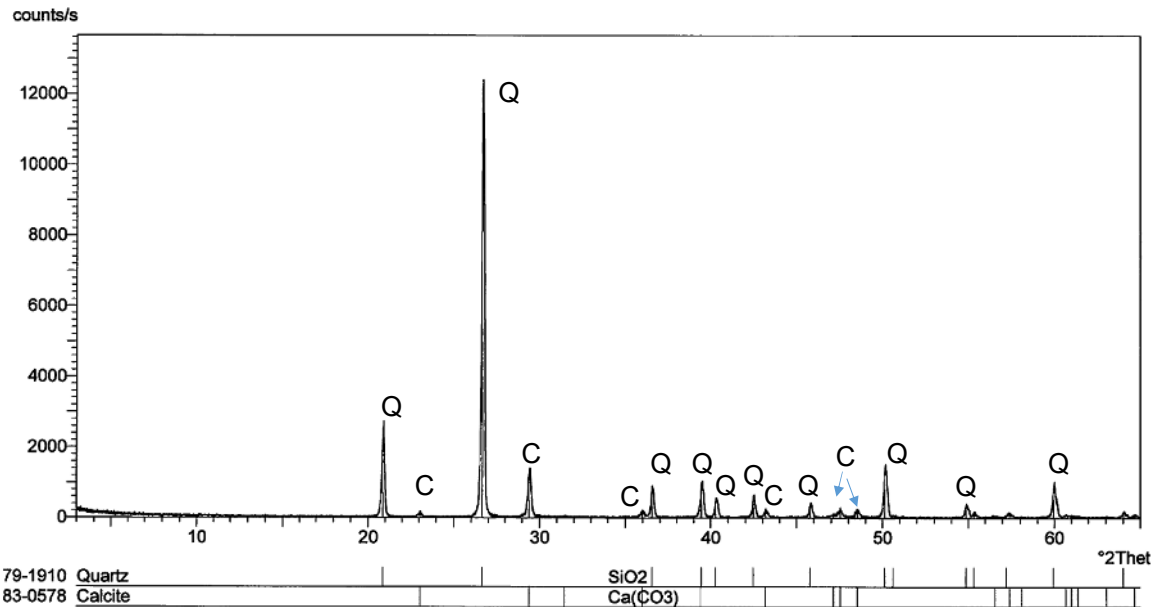
**Table S1.** Specifications of X-ray CT and CMT imaging facilities

Specification	Values
<b>Column-scale X-ray CT imaging</b>	
<i>X-ray directional open type (DOTD) tube</i>	
Max. Voltage	220 kV
Max. Current	3000 $\mu$ A
Focal spot	6 $\mu$ m
<i>Digital flat panel Detector with 16 inch intensifier</i>	
A/D converter	16 bits
Active Area	400 x 400 mm
Total pixel number	2024 x 2024
<b>Pore-scale X-ray CMT imaging</b>	
<i>Nano-focus open X-ray source tube</i>	
Max. Voltage	120 kV
Max. Current	200 $\mu$ A
Focal spot size	0.4 $\mu$ m
<i>Digital flat panel detector with 16 inch intensifier</i>	
A/D converter	16 bits
Active area	400 x 400 mm
Total pixel number	2024 x 2024



**Table S2.** X-ray CT and CMT imaging conditions

Conditions	Values
<b>Column-scale X-ray CT imaging</b>	
Voltage used in this study	150 kV
Current used in this study	1000 $\mu$ A
Exposure time	1 sec
Number of projection	360
Source-to-object distance	120 mm
Pixel pitch	50.9 $\mu$ m
<b>Pore-scale X-ray CMT imaging</b>	
Voltage used in this study	110 kV
Current used in this study	100 $\mu$ A
Exposure time	1 sec
Number of projection	1200
Source-to-object distance	44 mm
Pixel pitch	3–8 $\mu$ m



**Fig. S1.** The X-ray diffraction (XRD) analysis result of a MICP-treated sand sample. The result confirms that the host sand is mostly composed of quartz and the precipitated mineral is mostly calcite. The quartz and calcite content in this sample was 85% and 15%, respectively.