

## Supporting Information for

### Effect of Fluid-Rock Interactions on In Situ Bacterial Alteration of Interfacial Properties and Wettability of CO<sub>2</sub>-Brine-Mineral Systems for Geologic Carbon Storage

Taehyung Park<sup>1</sup>, Sukhwan Yoon,<sup>2</sup> Jongwon Jung,<sup>3</sup> and Tae-Hyuk Kwon<sup>2\*</sup>

<sup>1</sup>Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon 34141, Korea

(Current affiliation: National Energy Technology Laboratory, U.S. Department of Energy, Morgantown, WV, 26505, USA)

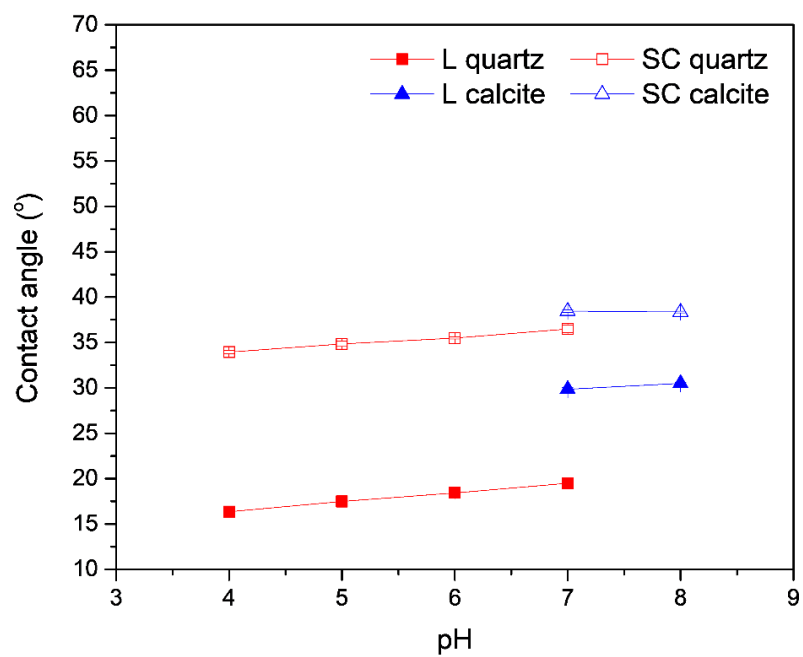
Department of Civil and Environmental Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon 34141, Korea

<sup>3</sup>School of Civil Engineering, Chungbuk National University, Chungbuk 28644, Korea

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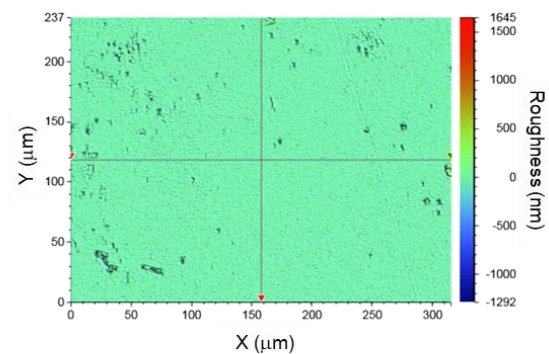
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\*Corresponding author phone: (+82) 42-350-3628; email: t.kwon@kaist.ac.kr

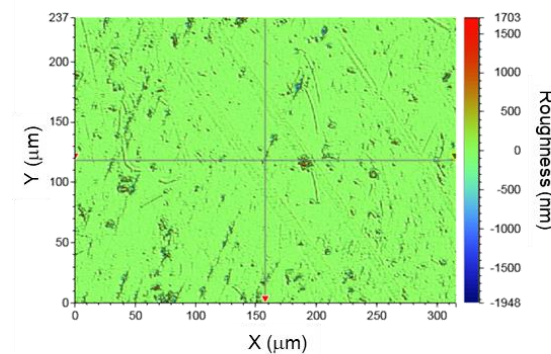


**Figure S1.** Effect of brine pH on the contact angle in brine-CO<sub>2</sub>-minerals in the range of pH 4–7 (quartz) and 7–8 (calcite) at 28°C, 10 MPa (L; liquid CO<sub>2</sub>) and 37°C, 10 MPa (SC; supercritical CO<sub>2</sub>).

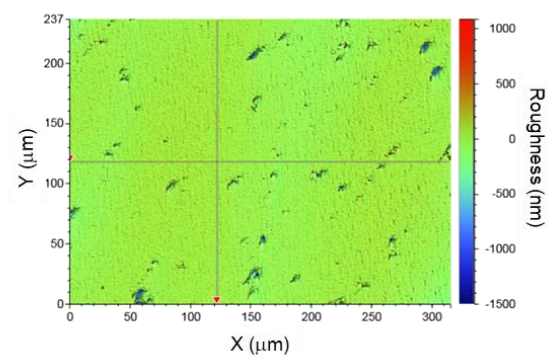
(a) Quartz before experiment ( $R_a$ , 12.5 nm)



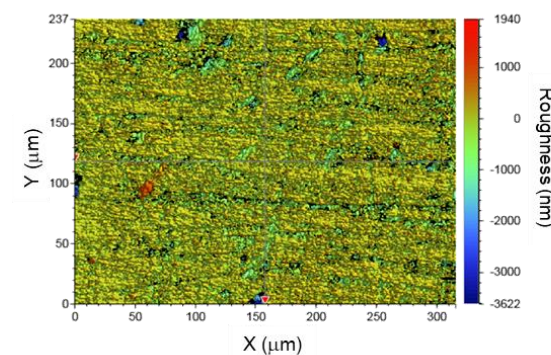
(b) Quartz after experiment ( $R_a$ , 19.5 nm)



(c) Calcite before experiment ( $R_a$ , 33.3 nm)

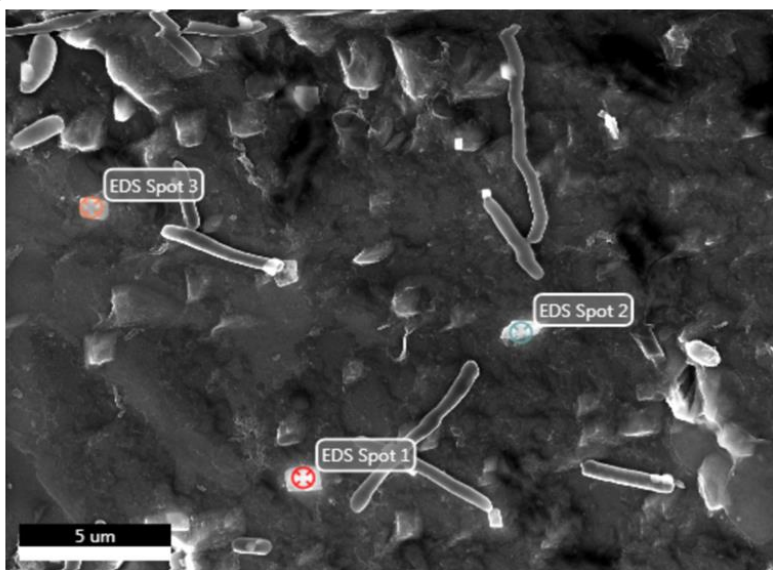


(d) Calcite after experiment ( $R_a$ , 215.9 nm)

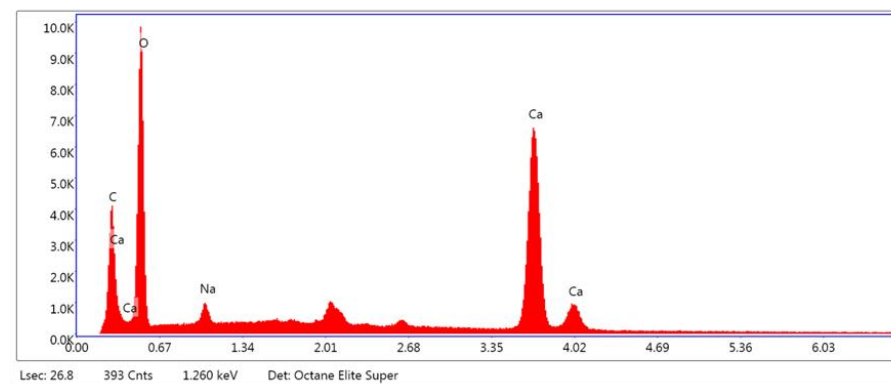


**Figure S2.** 3D profiler analyses to measure the roughness of (a) a quartz substrate before and (b) after the experiment and calcite substrate (c) before and (d) after the experiment.  $R_a$  indicates the average roughness of a surface.

(a)



(b)



**Figure S3.** (a) Energy Dispersive X-Ray Spectroscopy (EDS) analysis of crystals formed over calcite surfaces. Element analysis in (b) shows the atomic constituent element present in EDS Spot 1 present in the sample.