

1

## Supplementary Information

2 **Microbially Induced Calcium Carbonate Precipitation Driven by Ureolysis to**

3 **Enhance Oil Recovery**

4

5 Jun Wu, Xian-Bin Wang, Hou-Feng Wang, Raymond J. Zeng\*

6

7 CAS Key Laboratory for Urban Pollutant Conversion, Department of Chemistry,

8

9 \* Correspondence concerning this article should be addressed to:

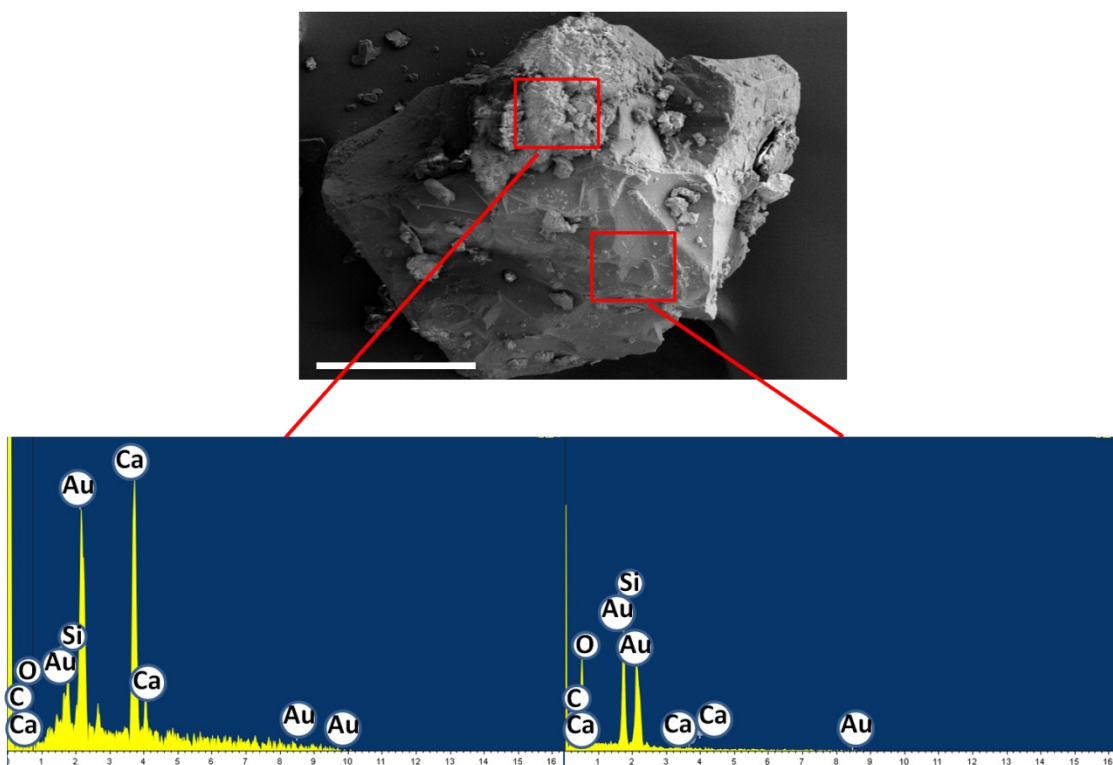
10 Raymond J. Zeng at rzeng@ustc.edu.cn. Tel/Fax: +86 551 63600203

11

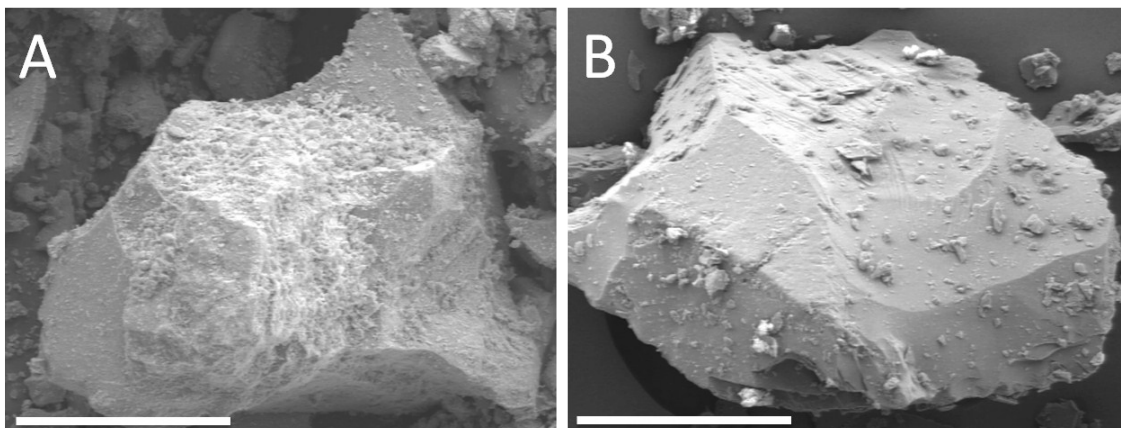
12 **There are 6 pages in Supplementary Information including 4 figures.**

13 **The preparation of growth medium:**

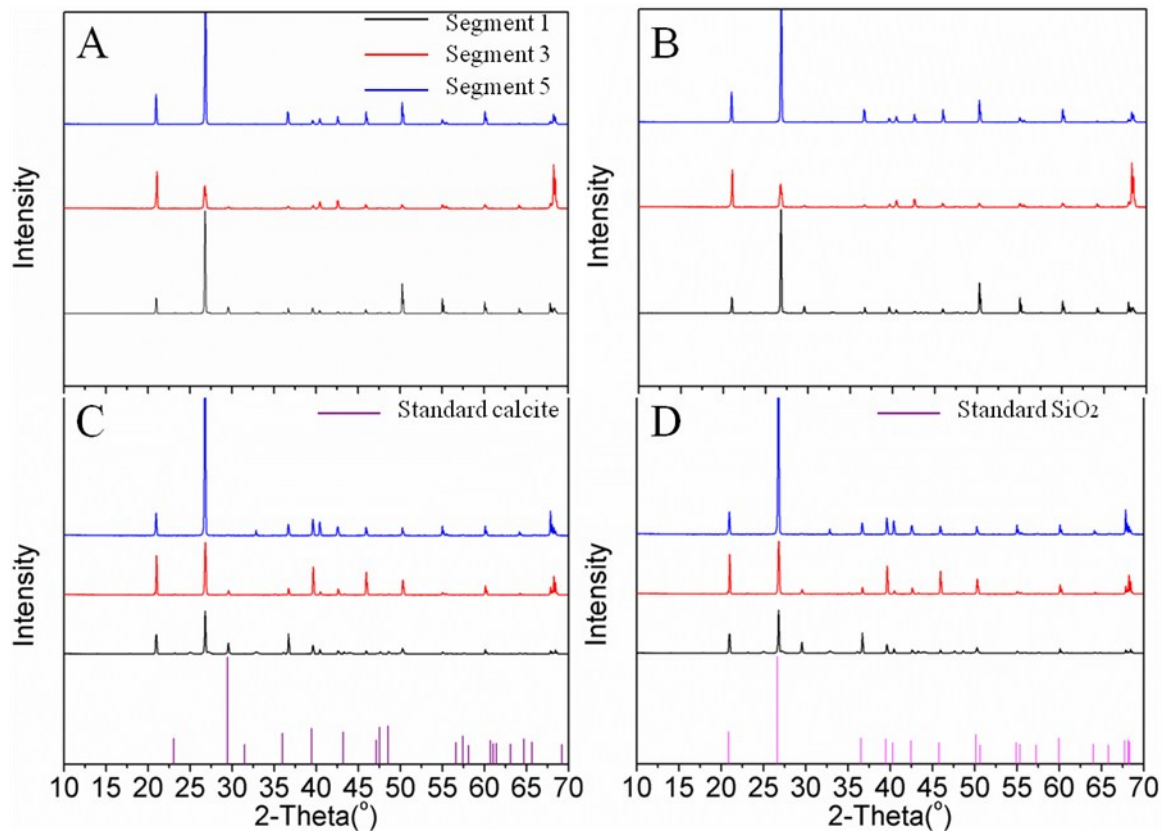
14       The growth medium was first prepared with 3 g of Difco Nutrient Broth and 10 g  
15 of ammonium chloride dissolved in deionized water, and then sterilized for 20 min at  
16 121°C. To avoid the decomposition of urea at high temperature, 20 g of urea was  
17 filtrated with a 0.22 µm filter, to be sterilized after cooling of the medium. Similarly,  
18 11.1 g of calcium chloride was sterilized with a 0.22 µm filter. A calcium-free growth  
19 medium was prepared in the same way as the growth medium except for the addition  
20 of calcium chloride. As necessary, the pH of the medium was adjusted to between 6.0  
21 and 6.3 before the addition of calcium chloride to prevent abiotic precipitation.



22 **Fig. S1** Scanning electron microscopy of precipitate attached on the surface of sand  
 23 and Energy-dispersive X-ray spectroscopy analyses of the inlet of coarse column 1,  
 24 Scale bar=50 $\mu$ m.



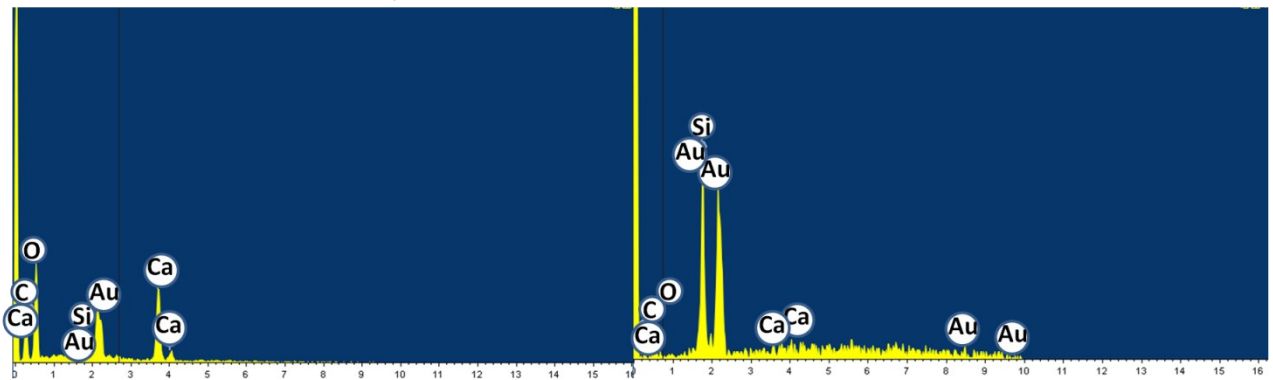
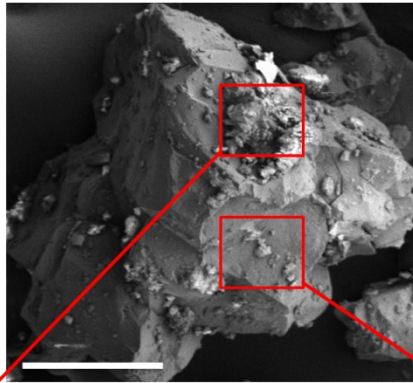
25 **Fig. S2** Scanning electron microscopy of precipitate attached on the surface of sand at  
26 different locations in coarse column 1, (A) Located at 3 cm (B) Located at 5 cm away  
27 from inlet of column, Scale bar=50 $\mu$ m.



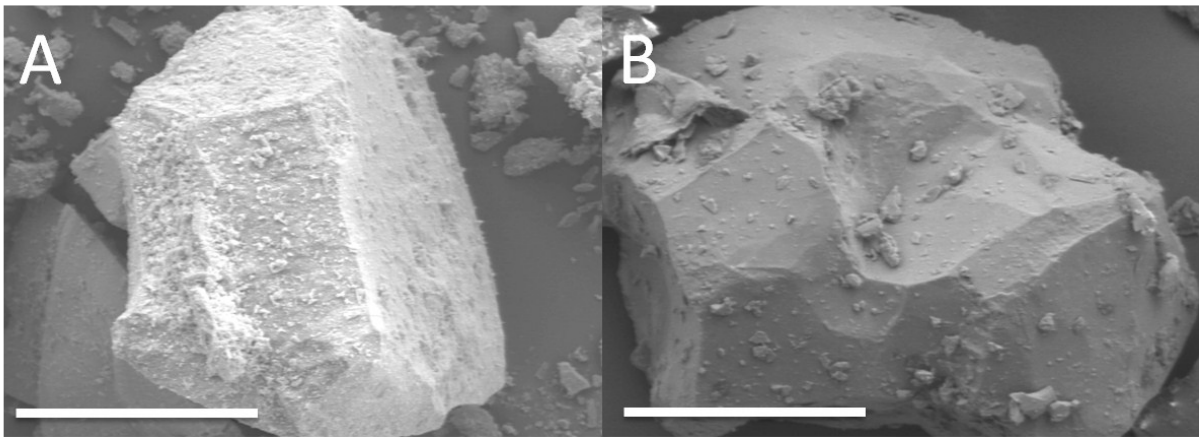
28

29 **Fig. S3** X-Ray Powder Diffraction analyses of samples at different locations in the

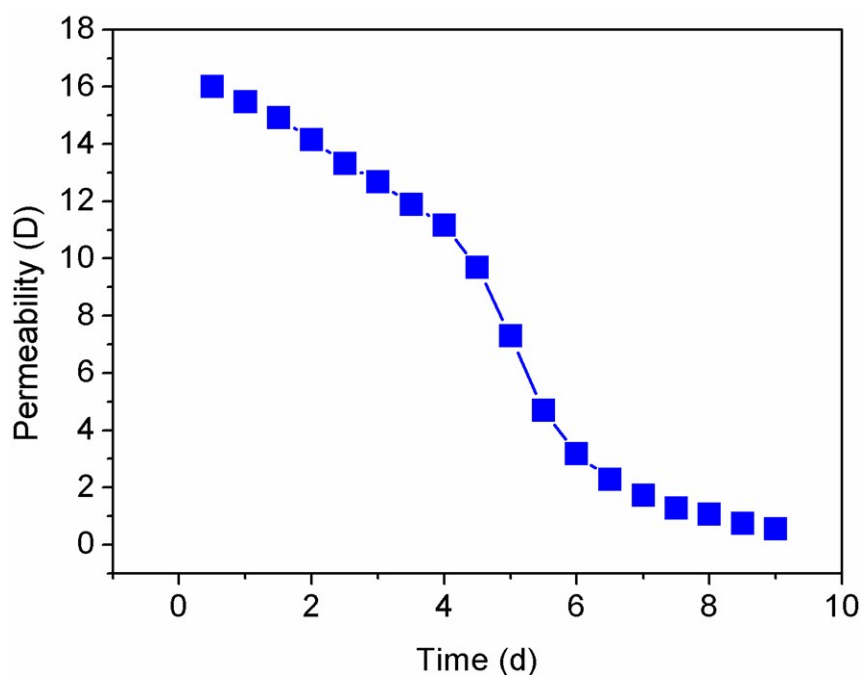
30 coarse column. (A) and (B) in coarse column 1, (C) and (D) in coarse column 2.



32 **Fig. S4** Scanning electron microscopy of precipitate attached on the surface of sand  
33 and Energy-dispersive X-ray spectroscopy analyses of the inlet of coarse column 2.  
34 Scale bar=50 $\mu$ m.



36 **Fig. S5** Scanning electron microscopy of precipitate attached on the surface of sand at  
37 different locations in coarse column 2. (A) Located at 3 cm (B) located at 5 cm away  
38 from the inlet of the column. Scale bar=50 $\mu$ m.



39

**Fig. S6** The change of permeability during the study.