

Interactive comment on “Qualitative and quantitative changes in detrital reservoir rocks caused by CO₂-brine-rock interactions during first injection phases (Utrillas sandstones, Northern Spain)” by E. Berrezueta et al.

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Dear Editor,

The authors would like to thank the anonymous reviewer for her/his contributions to this manuscript. We must acknowledge that the incorporation of the recommended suggestions improved the quality of the manuscript. All referee's comments are included in the revised version of the manuscript highlighted in green. The detailed corrections were uploaded as a pdf supplement file (revised manuscript 2b).

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Comment 1) Authors' reply: that the presence of non-dissolved SC CO₂ in the brine was not in contact with the rock. This occupied the top of the test chamber. Sample+brine+CO₂ were up to supercritical conditions for 24 hours. Sample+brine+CO₂ were 6 hours in conditions below 38°C and 7.8 MPa: 3 hours from ambient conditions to supercritical conditions and 3 hours to go from supercritical conditions to ambient conditions.

Answer: Included: Page 7 line 14-20. “The experimental runs comprised: a) a pressurized CO₂ injection (3 h, from ambient conditions to supercritical condition); b) a pressurized stabilization (24 h, no CO₂ flow inside the chamber) and c) CO₂ pressure release (3 h, from supercritical conditions to ambient conditions). In general, the presence of non-dissolved SC CO₂ in the brine was not in contact with the rock. This occupied the top of the test chamber. Sample+brine+CO₂ were up to supercritical conditions for 24 hours. Sample+brine+CO₂ were 6 hours in conditions below 38°C and 7.8 MPa.”

Comment 2) that the measured pH (pH = 5.2) is not representative of the solution pH during the experiment, as it was measured after the experiment during depressurization (Table 2).

Answer: Included: Page 14, lines 17-19: “The measured pH (5.2) representative of the solution pH during the experiment, as it was measured after the experiment during depressurization (Table 2).”

Comment 3) that you assume that the acidified brine interact with the brine that is filling the pores. The low compressibility coefficient of a fluid in the case of an increase of pressure and temperature (as in this experiment) does not favour displacements of the fluid.

Answer: Included: Page 15, line 21-24. “We assume that the acidified brine interact with the brine that is filling the pores. The low compressibility coefficient of a fluid in the case of an increase of pressure and temperature (as in this experiment) does not

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favour displacements of the fluid".

Comment 4) pg. 2252: explain in the revised text that "in case of gas leakage in the chamber during the experiment, the pump maintains the experimental pressure".

Answer: Included: Page 7 line 1-2. "In case of gas leakage in the chamber during the experiment, this pump maintains the experimental pressure (7.8 MPa).

Please also note the supplement to this comment:

<http://www.solid-earth-discuss.net/7/C1395/2015/sed-7-C1395-2015-supplement.pdf>

Interactive comment on Solid Earth Discuss., 7, 2243, 2015.