Electronic Supplementary Material (ESI) for Chemical Science.

SUPPORTING INFORMATION

Bacterial spore detection and analysis using hyperpolarized ^{129}Xe chemical exchange saturation transfer (Hyper-CEST) NMR

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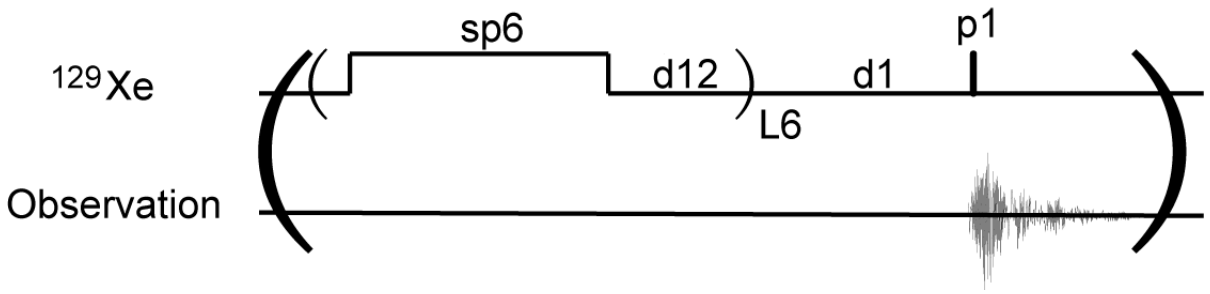

Figure S1. ^{129}Xe Hyper-CEST pulse sequence. Components of the pulse sequence include: sp6, 180-degree saturation pulse (DSnob shaped) tuned at pre-selected frequencies, 0.8 - 2.6 ms; d12, delay between saturation pulses, 0.02 - 20 ms; d1, delay before 90-degree excitation pulse, 0.5 - 1.5 s; p1, 90-degree excitation pulse, 26 ms; L6, number of saturation cycles, 0 – 2000. For Hyper-CEST profile experiments, sp6 frequency is systematically changed; for depolarization rate experiments, L6 is increased in fixed step widths in each experiment.

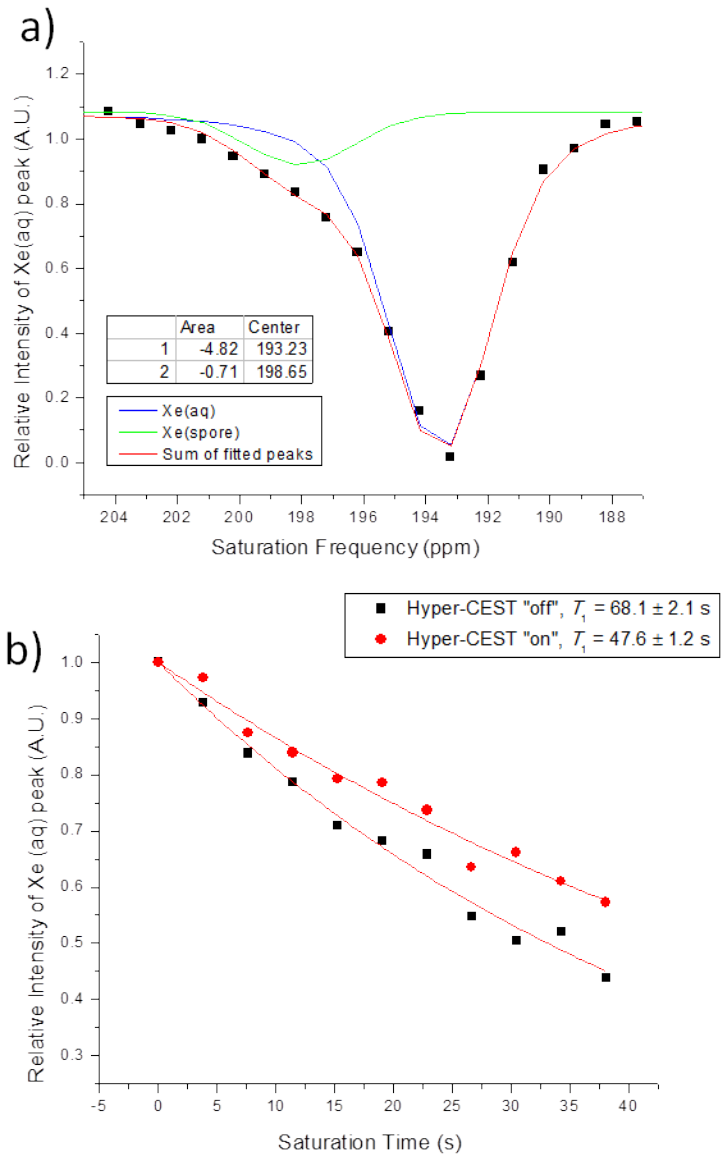

Figure S2. (a) Hyper-CEST profile of *B. anthracis* Sterne-JAB-13 spores at 1.2×10^7 cfu/mL with 300 pulse cycles for saturation exchange; (b) Hyper-CEST depolarization curve of the same spore sample as in (a).

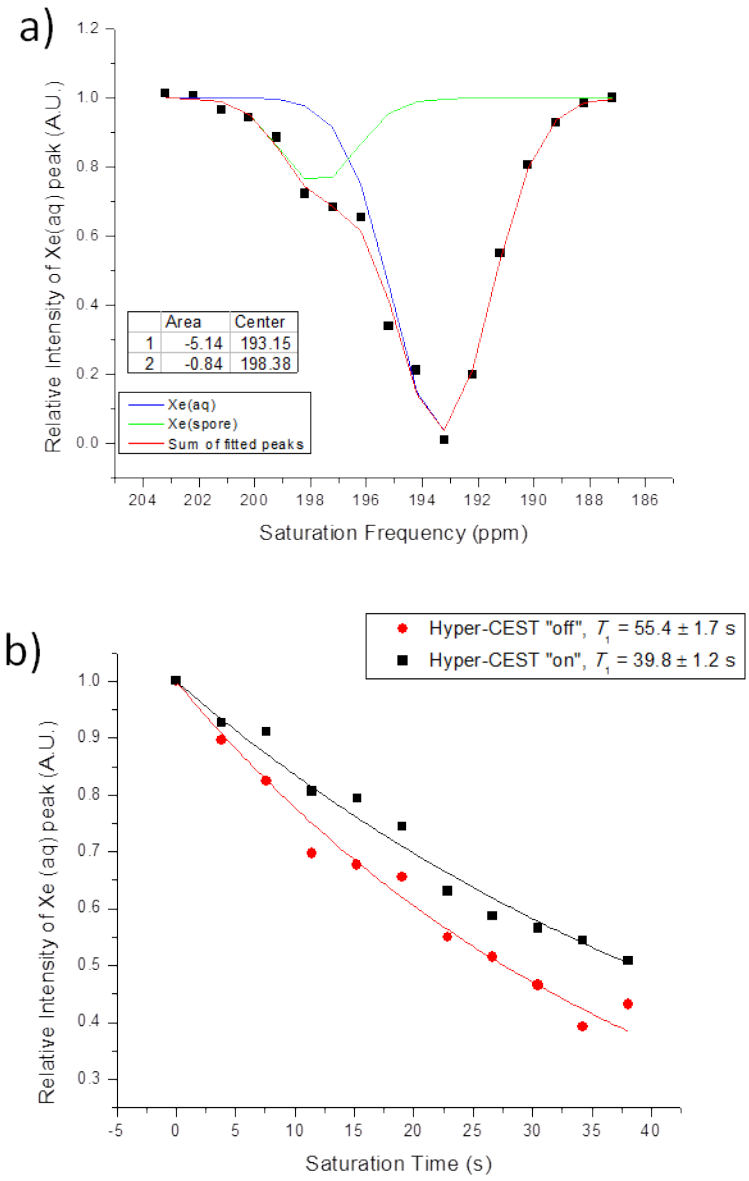

Figure S3. (a) Hyper-CEST profile of *B. anthracis* RG56 spores at 1.2×10^7 cfu/mL with 300 pulse cycles for saturation exchange; (b) Hyper-CEST depolarization curve of *B. anthracis* RG56 spores at 1.2×10^7 cfu/mL.

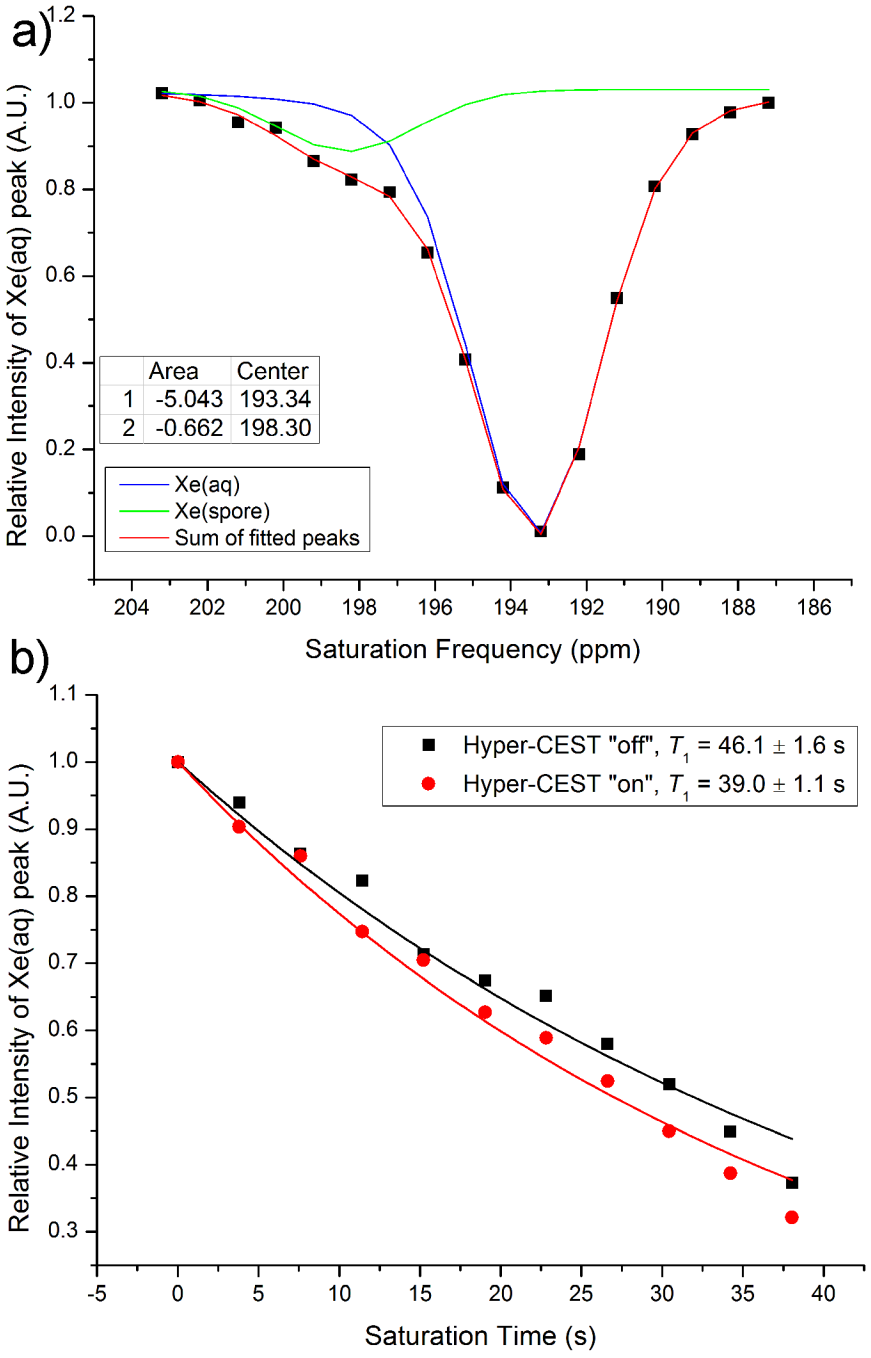

Figure S4. (a) Hyper-CEST profile of *B. subtilis* PY79 spores at 1.2×10^7 cfu/mL with 200 pulse cycles for saturation exchange; (b) Hyper-CEST depolarization curve of *B. subtilis* PY79 spores at 1.2×10^7 cfu/mL.

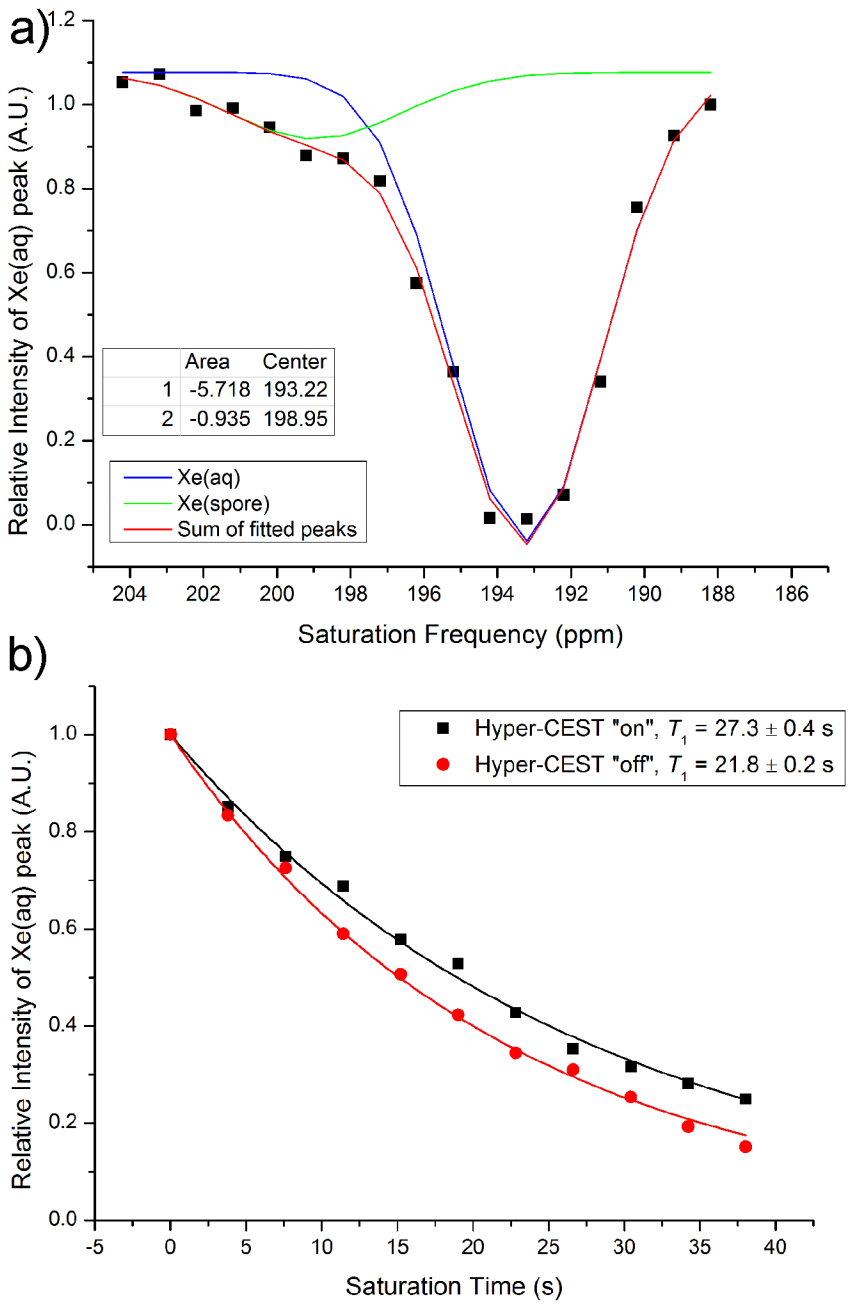

Figure S5. (a) Hyper-CEST profile of *B. subtilis* AD28 spores at 1.2×10^7 cfu/mL with 200 pulse cycles for saturation exchange; (b) Hyper-CEST depolarization curve of *B. subtilis* AD28 spores at 1.2×10^7 cfu/mL.

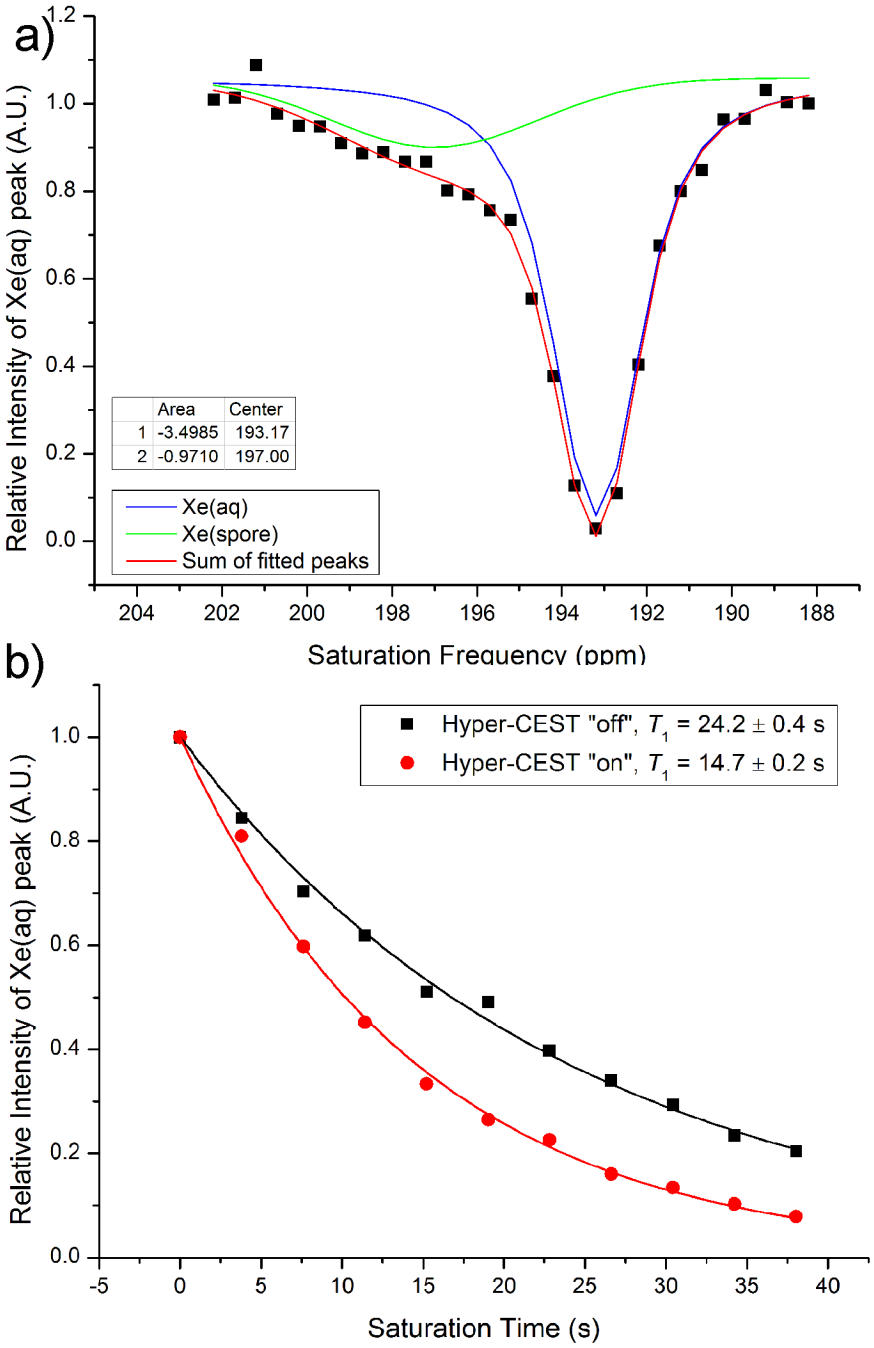

Figure S6. (a) Hyper-CEST profile of *B. subtilis* AD142 spores at 1.2×10^7 cfu/mL with 200 pulse cycles for saturation exchange; (b) Hyper-CEST depolarization curve of *B. subtilis* AD142 spores at 1.2×10^7 cfu/mL.

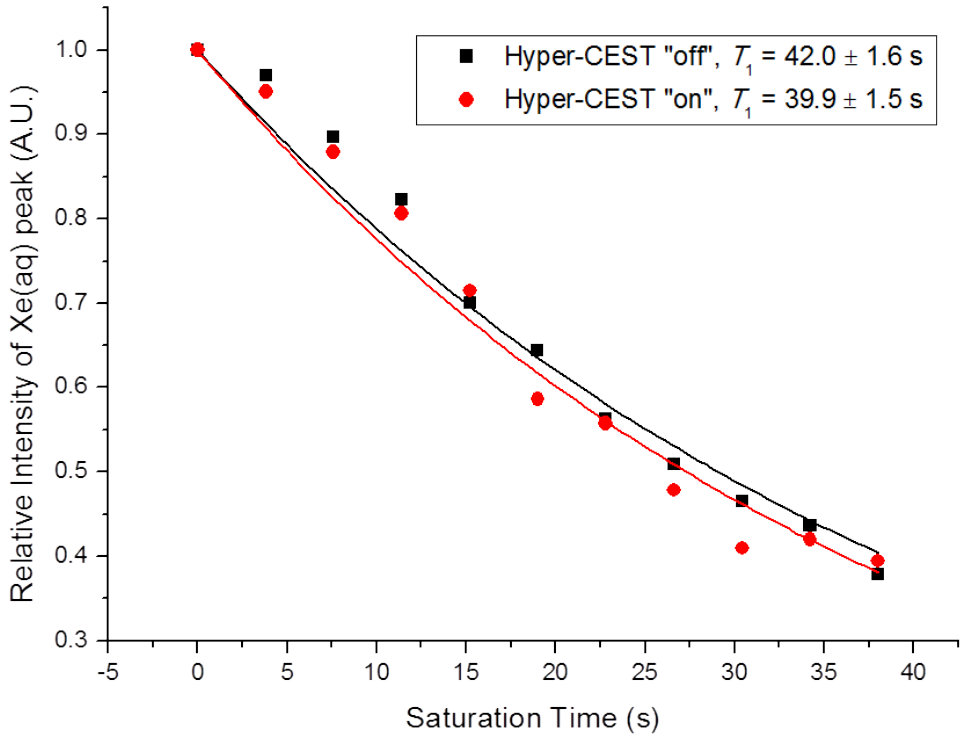

Figure S7. Hyper-CEST depolarization curve of *wild type B. anthracis* (Sterne 34F2) spores at 1.2×10^7 cfu/mL.

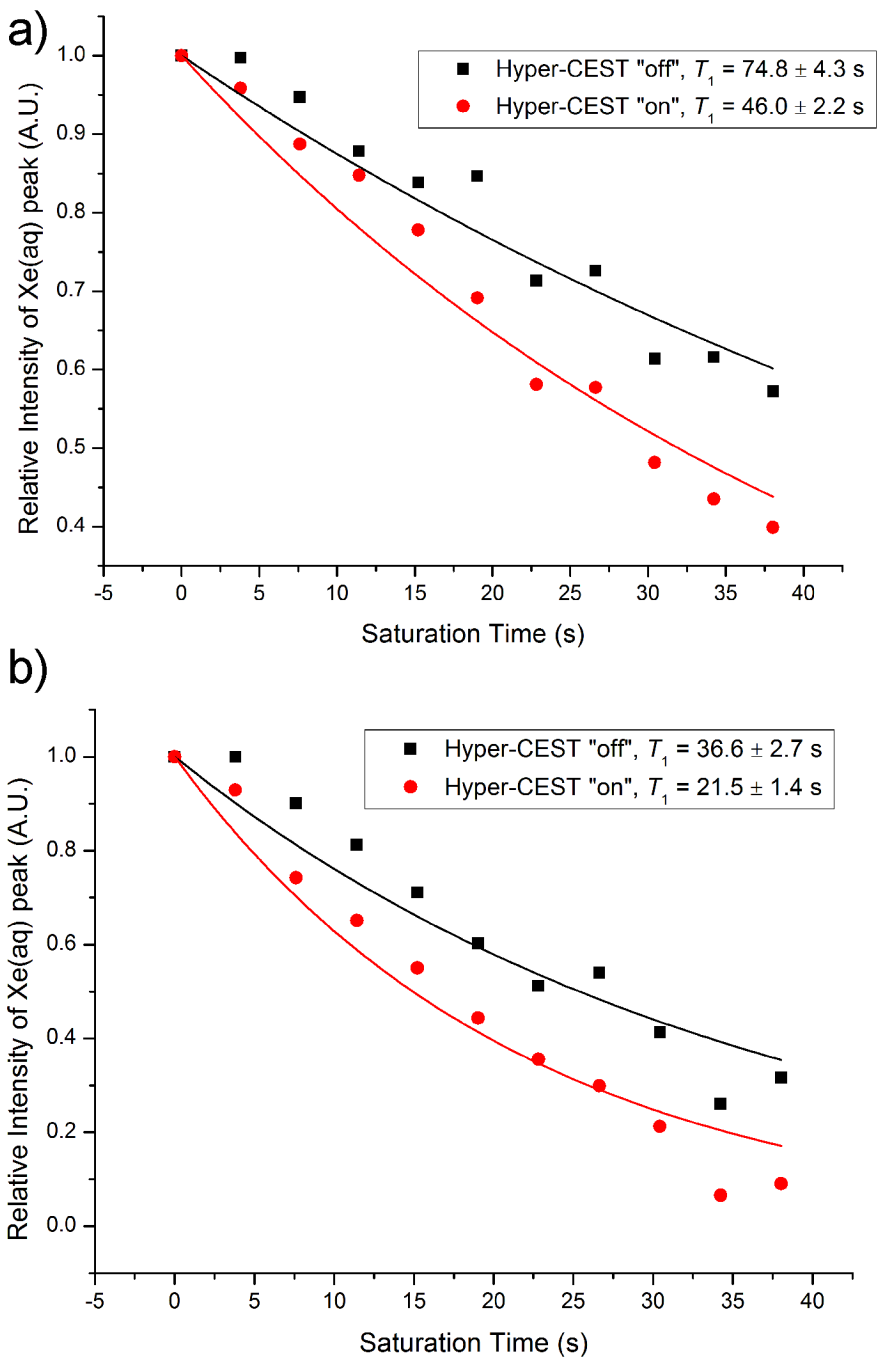

Figure S8. (a) Hyper-CEST depolarization curve of *B. subtilis* AD142 spores at 1.2×10^5 cfu/mL; (b) Hyper-CEST depolarization curve of *B. subtilis* AD142 spores at 1.2×10^6 cfu/mL.