# Supporting Information

# A new approach for pyrene bioremediation using bacteria immobilized in layer-by-layer assembly microcapsules: Dynamics of soil bacterial community

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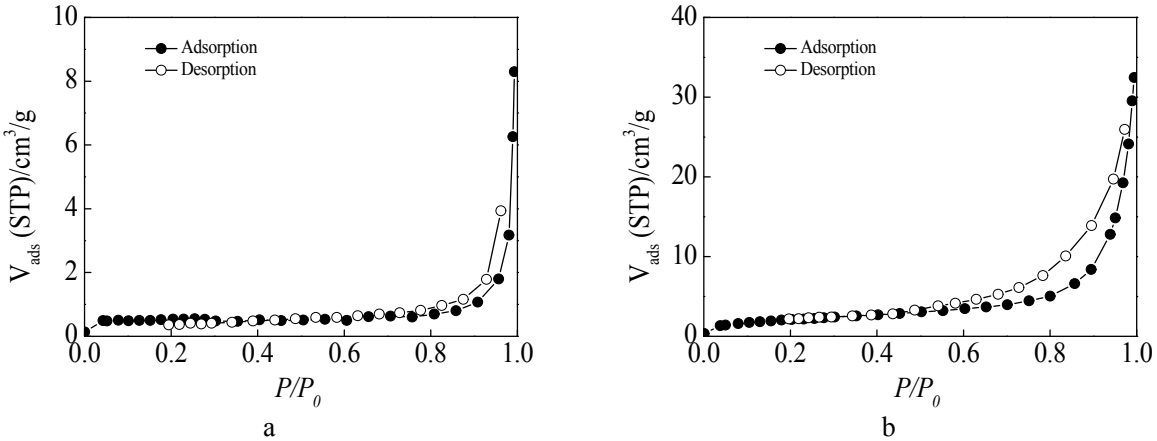
**Standard protocol of biological slices preparation for TEM analysis**

The TEM specimens of *P. putida* cells were prepared by the following procedures. The native and treated cells were quickly fixed in the mixture solution (4% of paraformaldehyde and 2.5% of glutaraldehyde) for 12 h at 4 °C. Followed by washing three times, the samples were postfixed with 1% osmium tetroxide in 0.05M sodium cacodylate buffer for 2 h. After fixation, the samples were concentrated by centrifugation at 6000 rpm for 2 min and washed twice with PBS buffer. The concentrated cells were dehydrated with sequential treatment with 30, 50, 70, 80, 90, and 100% ethanol for 10 min. The cells were then infiltrated and embedded in Spurr's resin with propylene oxide (treatment with 3:1, 2:1, 1:1, 1:2, and 1:3 of propylene oxide/Spurr's resin mixtures for 30min each, and100% Spurr's resin for 25 h). The samples, filled with Spurr's resin, were cured overnight at 70 °C to form sample blocks. The polymerized blocks were sectioned using an ultramicrotome (MT-X, RMC), and the thin sections were stained in 2% uranyl acetate and lead citrate, and examined by TEM at 100 kV accelerating potential.

**Figure S1**



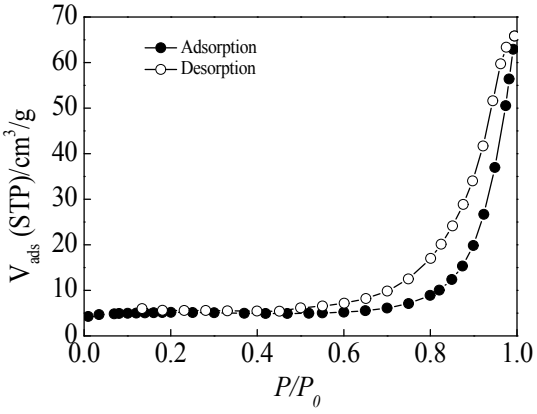



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Figure S1 $N_2$ adsorption - desorption isotherms of the $CaCO_3$ template (a), LBL microcapusule with (b), and without (c) $CaCO_3$ template.