Supporting Information

Size Effects in Magnetic Separation for Rapid and Efficient Bacteria Removal

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1. Supplementary results and discussion

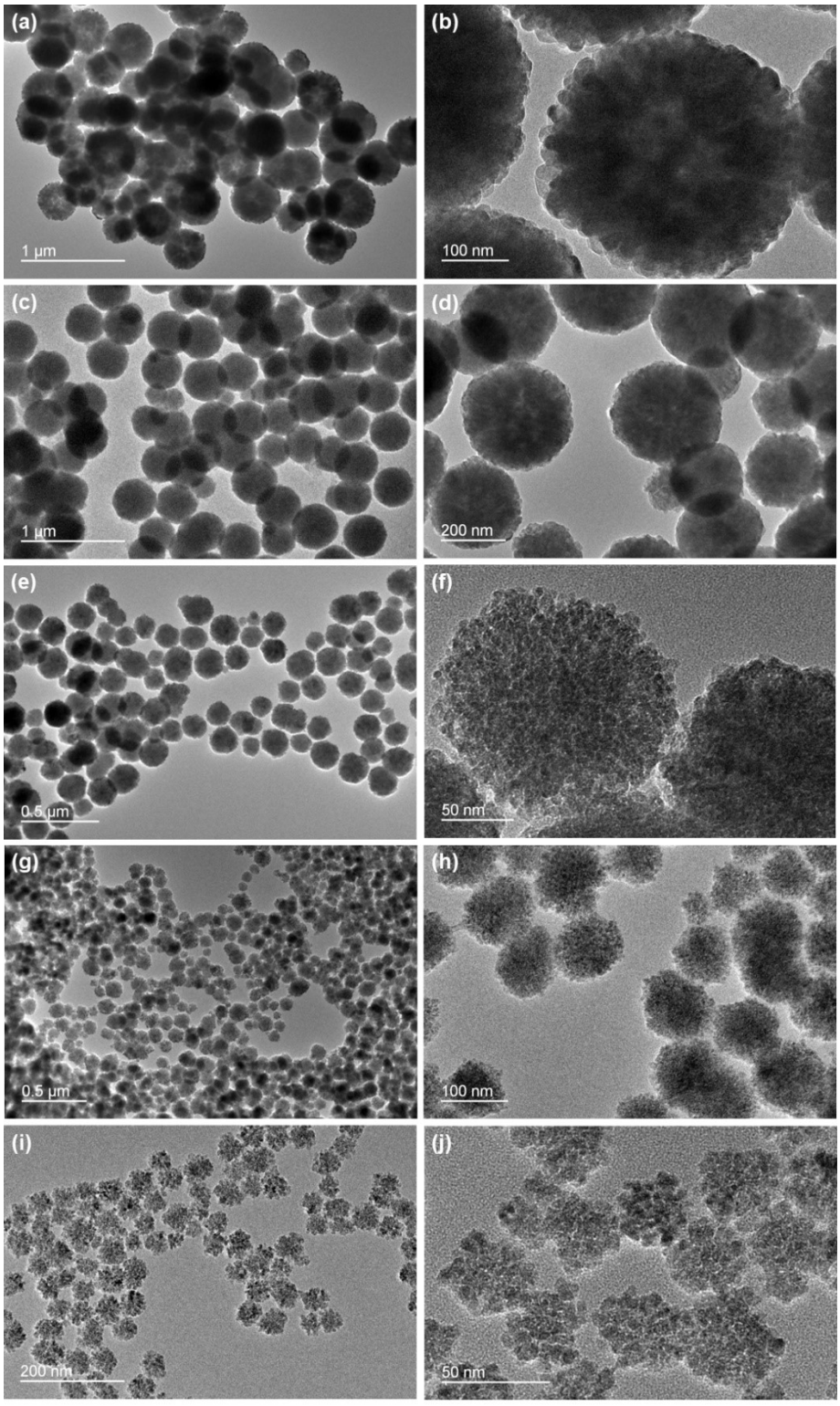

Figure S1. TEM images of porous magnets: PM_420 nm (a, b), PM_360 nm (c, d), PM_210 nm (e, f), PM_90 nm (g, h), and PM_50 nm(i, j).

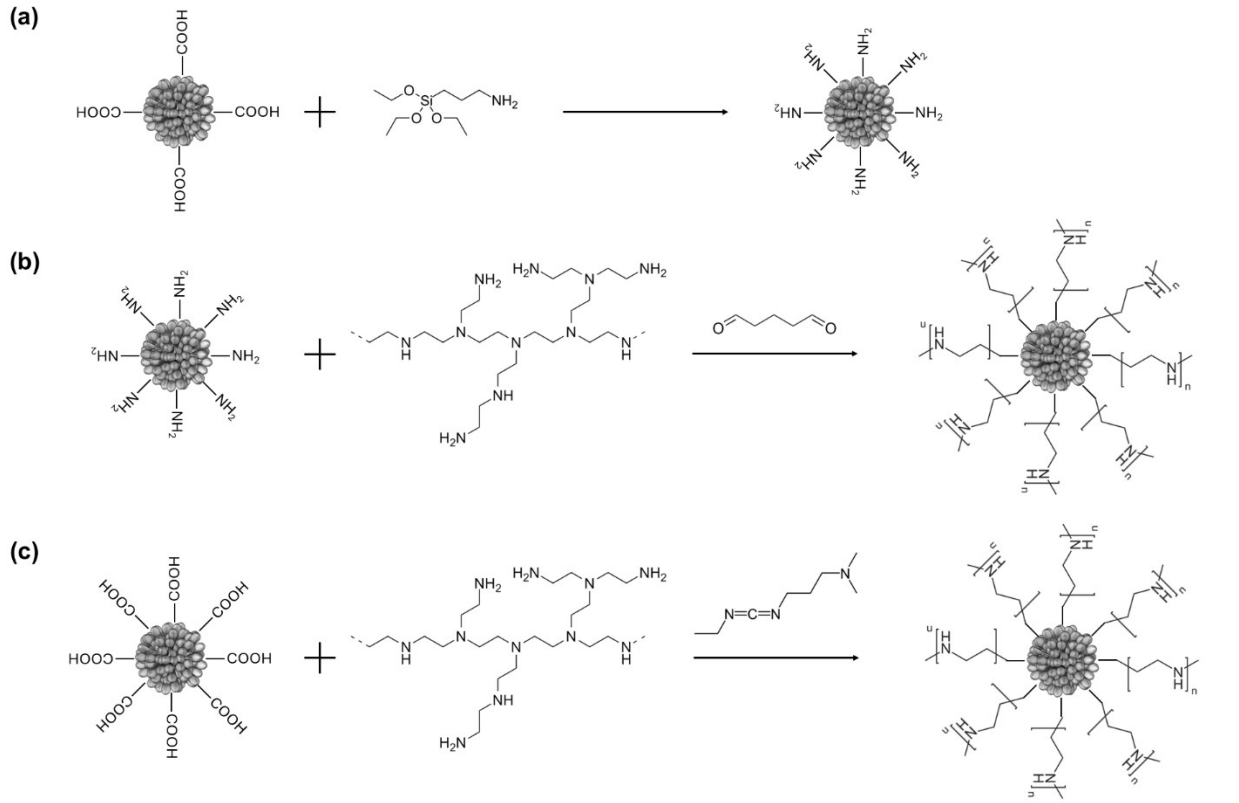

Figure S2. The PEI functionalization of porous magnets. PM_420 nm, PM_360 nm, PM_210 nm and PM_90 nm was first modified with APTES (a) and then functionalized with PEI with glutaraldehyde as cross-linking agent (b). PM_50 nm was functionalized with PEI through EDC/NHS chemistry (c).

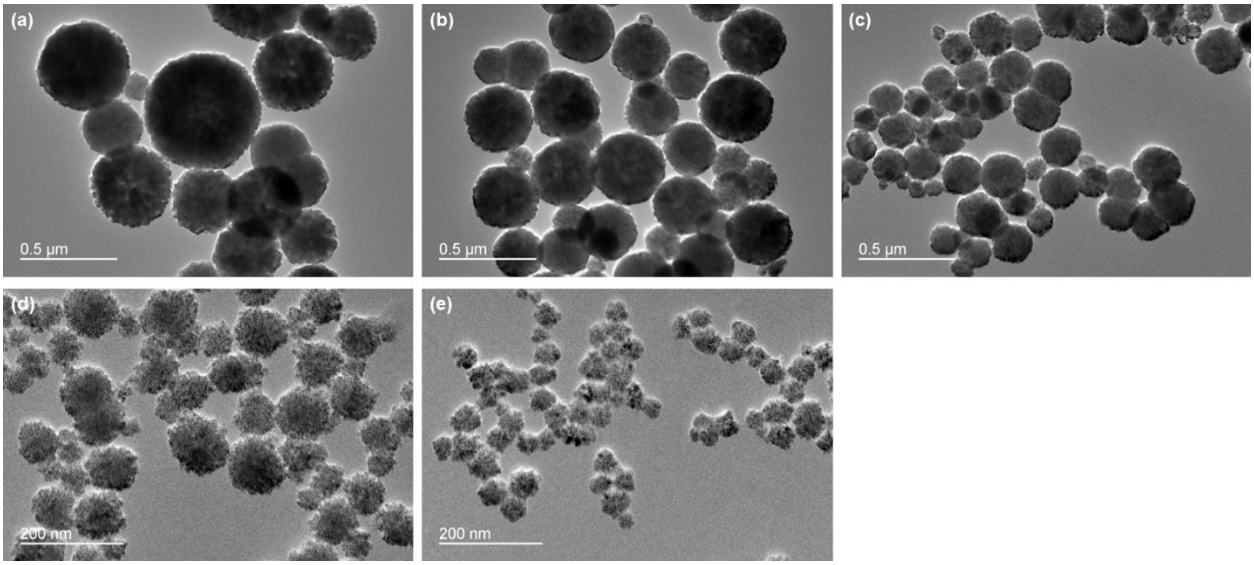

Figure S3. TEM images of PEI modified porous magnets: PPM_420 nm (a), PPM_360 nm (b), PPM_210 nm (c), PPM_90 nm (d), and PPM_50 nm(e).

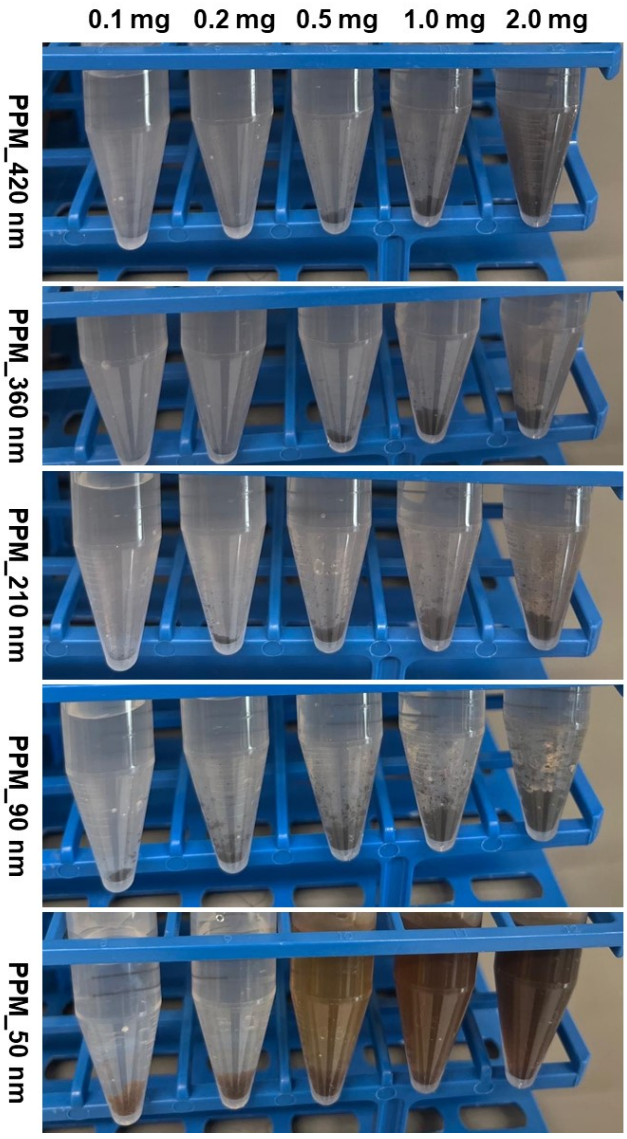

Figure S4. The images of *E. Coli* bacteria (10^9 CFU) reacted with different amounts of particles (0.1 – 2.0 mg).

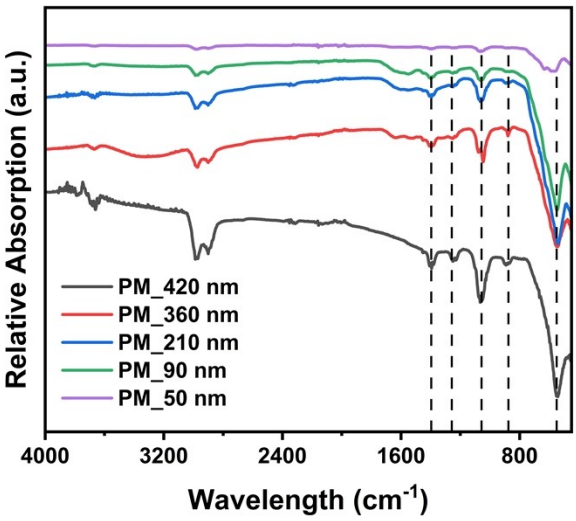

Figure S5. The FTIR spectrums of porous magnets with different sizes (before PEI coatinbg).

References

(1) Liu, Y.; Li, Y.; Li, X.-M.; He, T. Kinetics of (3-Aminopropyl)Triethoxylsilane (APTES) Silanization of Superparamagnetic Iron Oxide Nanoparticles. *Langmuir* **2013**, *29* (49), 15275–15282. https://doi.org/10.1021/la403269u.
(2) Lastoskie, C.; Gubbins, K.; Quirke, N. Pore Size Distribution Analysis of Microporous Carbons: A Density Functional Theory Approach. *The Journal of Physical Chemistry* **1993**, *97*. https://doi.org/10.1021/j100120a035.