

Supporting Information

Dendritic Chelating Agents 2. U(VI) Binding to Poly(amidoamine) and Poly(propyleneimine) Dendrimers in Aqueous Solutions.

Environmental Science and Technology

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Table S1. ^aExtents of Protonation of PAMAM and PPI Dendrimers Evaluated in this Study.

G5-NH ₂ PAMAM	pH 3.0	pH 7.0	pH 9.0	pH 11.0
α_{NT}	0.99	0.17-0.41	0.00	0.00
α_{NH_2}	0.99	0.99	0.63-0.91	0.02-0.09
G4-NH ₂ PAMAM	pH 3.0	pH 7.0	pH 9.0	pH 11.0
α_{NT}	0.99	0.17-0.41	0.00	0.00
α_{NH_2}	0.99	0.99	0.63-0.91	0.02-0.09
G3-NH ₂ PAMAM	pH 3.0	pH 7.0	pH 9.0	pH 11.0
α_{NT}	0.99	0.17-0.41	0.00	0.00
α_{NH_2}	0.99	0.99	0.63-0.91	0.02-0.09
G4-OH PAMAM	pH 3.0	pH 7.0	pH 9.0	pH 11.0
α_{NT}	0.99	0.17-0.41	0.00	0.00
α_{OH}	1.00	1.00	1.00	1.00
G3.5 PAMAM	pH 3.0	pH 7.0	pH 9.0	pH 11.0
α_{NT}	0.99	0.17-0.41	0.00	0.00
α_{COOH}	0.95	0.0	0.00	0.00
G5-NH ₂ PPI	pH 3.0	pH 7.0	pH 9.0	pH 11.0
α_{NT}	0.99	0.11	0.00	0.00
α_{NH_2}	0.99	0.99	0.81	0.04

^aThe extents of protonation of the dendrimer tertiary amine, primary amine, hydroxyl and carboxyl groups (α_{NT} , α_{NH_2} , α_{OH} and α_{COOH}) of the PPI and PAMAM dendrimers were calculated using the Henderson-Hasselbach equation (1-2): $\log \frac{\alpha^i}{1-\alpha^i} = \text{pK}_a^i - \text{pH}$; where i = NT, NH₂, OH and COOH.

1. Diallo, M. S.; Christie, S.; Swaminathan, P.; Balogh, L.; Shi, X.; Um, W.; Papelis, L.; Goddard, W. A. III and Johnson, J. H. Jr. Dendritic chelating agents 1. Cu(II) binding to ethylene diamine core poly(amidoamine) dendrimers in aqueous solutions. *Langmuir*. **2004**, 20, 2640-2651.
2. Kabanov, V. A.; Zezin, A. B.; Rogacheva, V. B.; Gulyaeva, V. B.; Zansochova, M. F.; Joosten, J. G. H.; Brackman, J. Polyelectrolyte behavior of Astramol poly(propyleneimine) dendrimers. *Macromolecules*. **1998**, 31, 5142-5144.

Figure S1: Fluorescence spectra and calibration curve of U(VI) in 10 wt% phosphoric acid (H_3PO_4) solution at room temperature

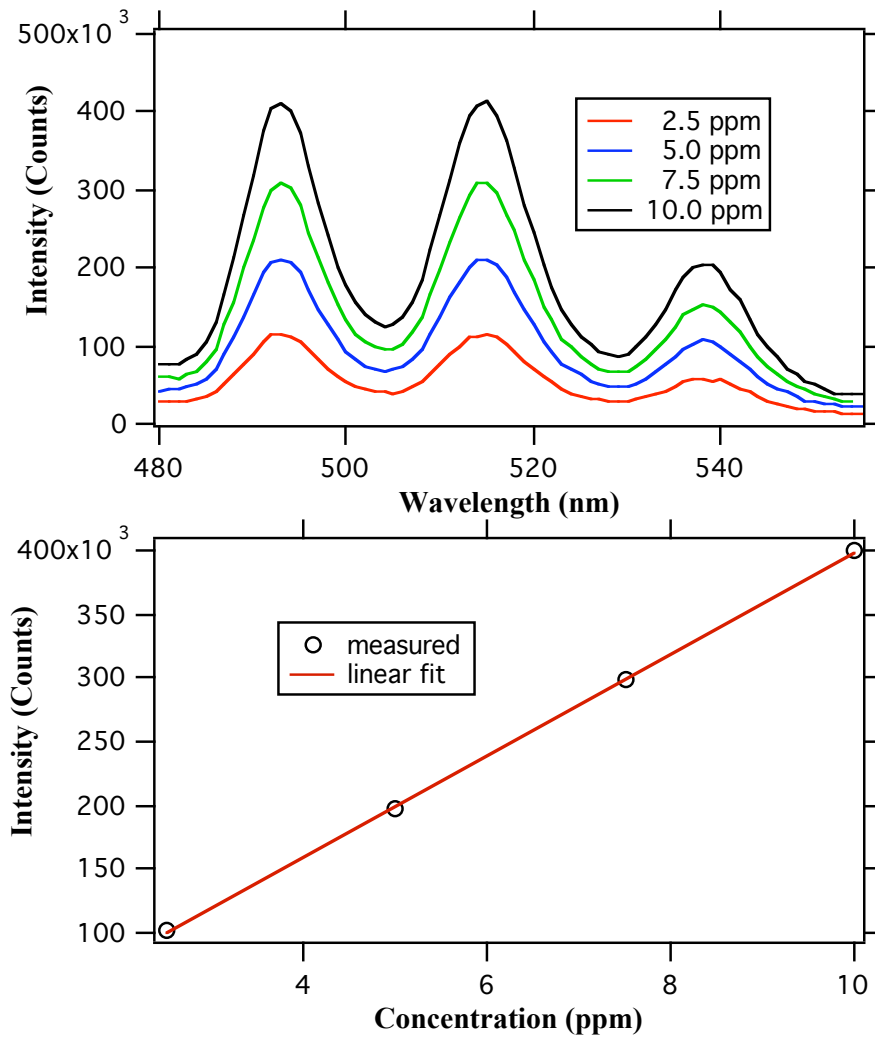


Figure S2: Fluorescence spectra of U(VI) in aqueous solutions of G4-NH₂ and G4-OH PAMAM dendrimers at room temperature.

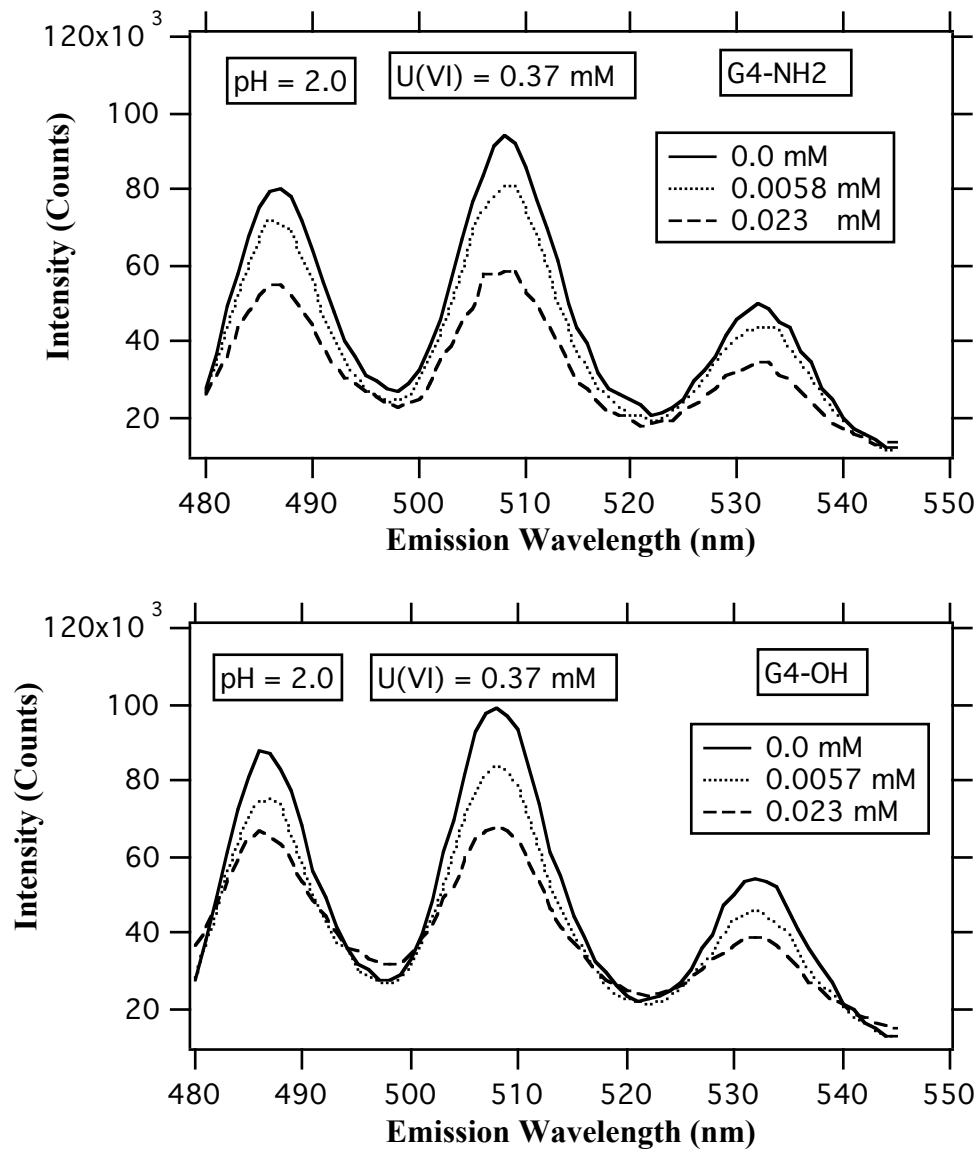


Figure S3: Effects of sodium carbonate (Na_2CO_3) and sodium chloride (NaCl) on the fractional binding of U(VI) in aqueous solutions of G4-NH₂ PAMAM dendrimer at room temperature

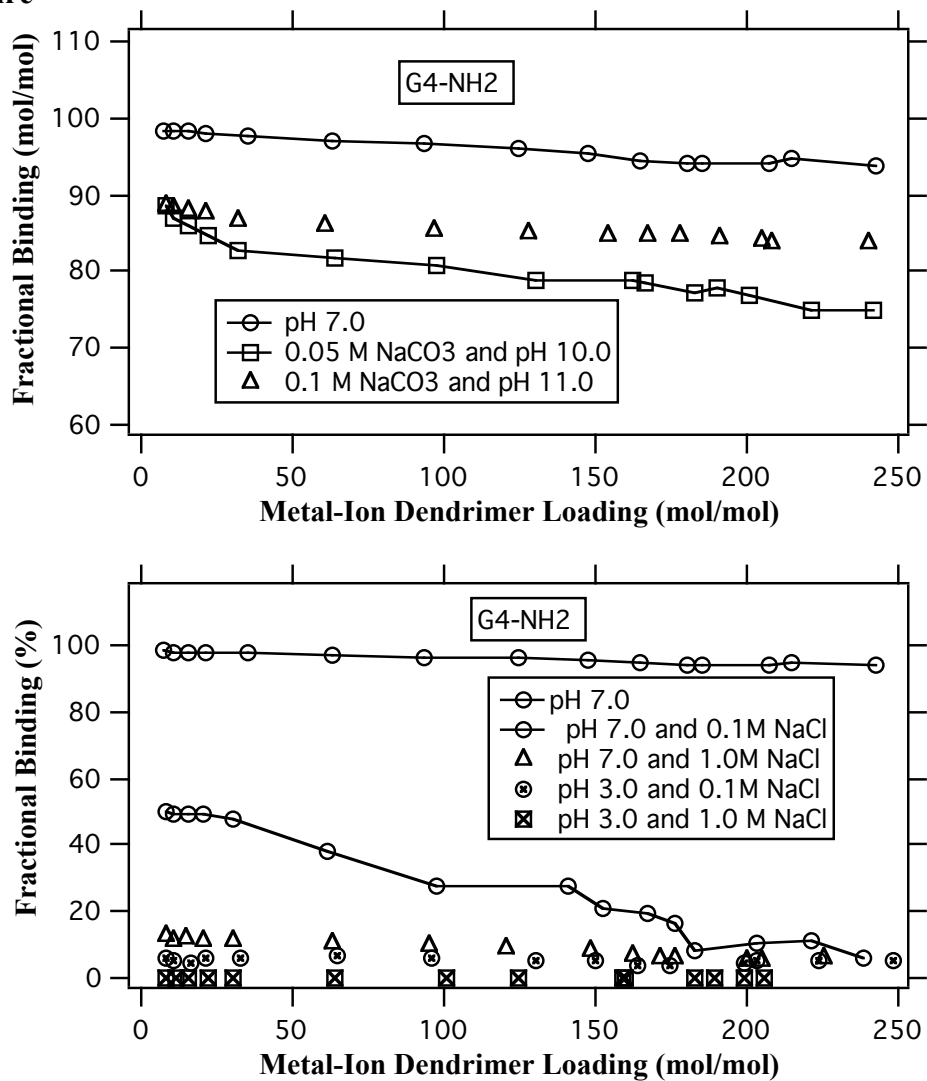
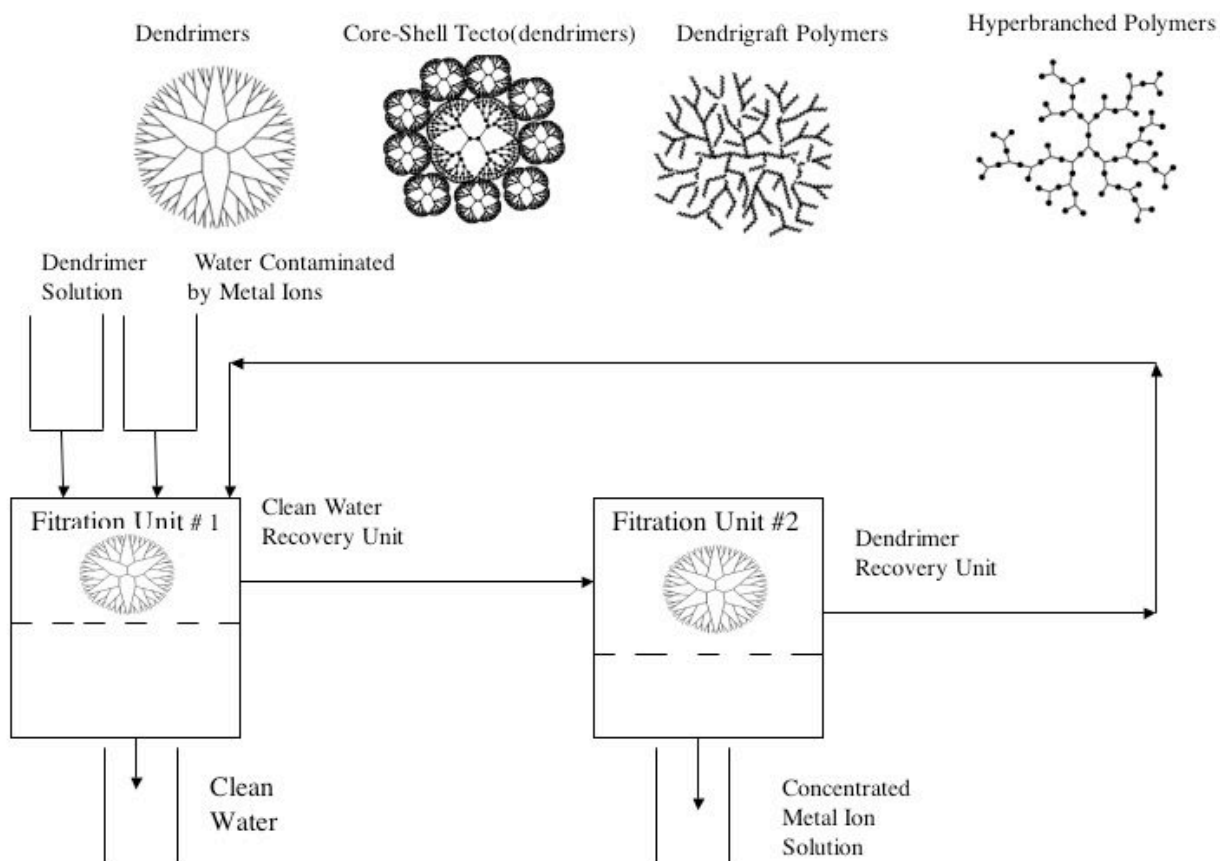


Figure S4: Recovery of Metal Ions from Aqueous Solutions by Dendrimer Enhanced Filtration (1)



1. Diallo, M. S.; Chritie, S.; Swaminathan, P.; Johnson, J. H. Jr. and Goddard, W. A. III. Dendrimer Enhanced Ultrafiltration. 1. Recovery of Cu(II) from aqueous solutions using $gx-nh_2$ pamam dendrimers with ethylene diamine Core. *Environ. Sci. Technol.* **2005**, 39, 1366-1377.