

Supplementary Materials

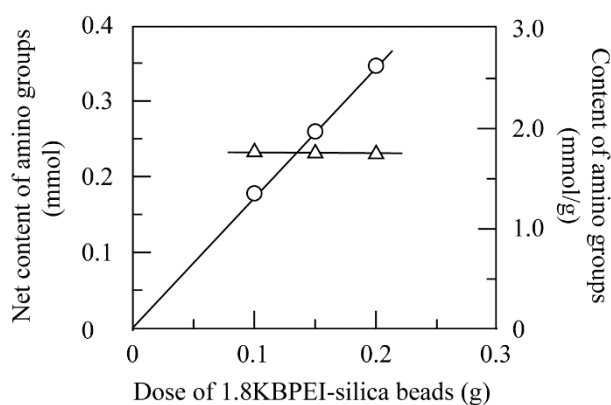


Figure S1: An example of the determination of the content of amino groups of 1.8KBPEI-silica beads by the back titration with an aqueous HCl solution at 20 mM.

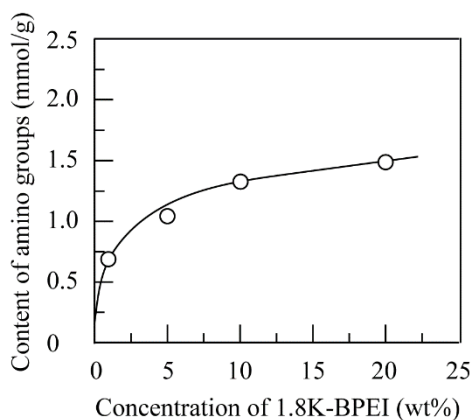


Figure S2: Change in the content of amino groups with the concentration of 1.8K-BPEI for the silica beads prepared by the treatment with GOPES at 0.10 M and 30°C for 10 min followed by the grafting of 1.8KBPEI at 70°C for 1 h.

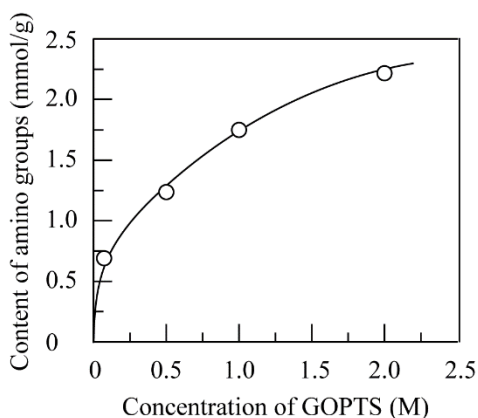


Figure S3: Change in the content of amino groups with the concentration of GOPTS for the silica beads prepared by the treatment with GOPTS at 30°C for 10 min followed by the grafting of 1.8KBPEI at 20 wt% and 70°C for 1 h.

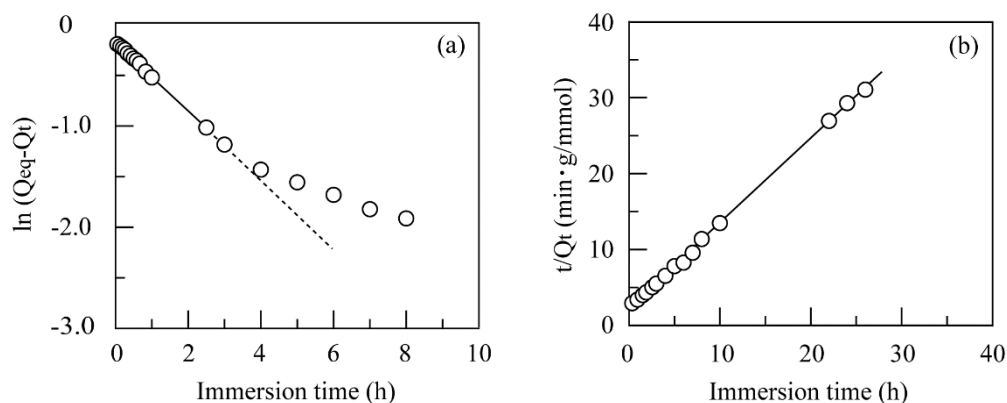


Figure S4: The determination of the (a) pseudo-first order constant, k_1 , and pseudo-second order constant, k_2 , for adsorption of Cr(VI) ions on the 1.8KBPEI-silica beads with the content of amino groups of 1.76 mmol/g in an aqueous 0.20 mM $\text{K}_2\text{Cr}_2\text{O}_7$ solution at pH 3.0 and 30°C.

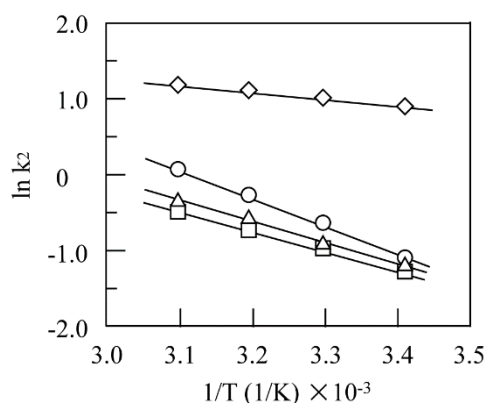


Figure S5. The plot of $\ln k_2$ against the reciprocal temperature for the 1.8KBPEI-silica beads with the contents of amino groups of 1.17 (\diamond), 1.40 (\circ), 1.76 (\triangle), and 2.17 (\square) mmol/g in an aqueous $\text{K}_2\text{Cr}_2\text{O}_7$ solution at 0.20 mM at pH 3.0.

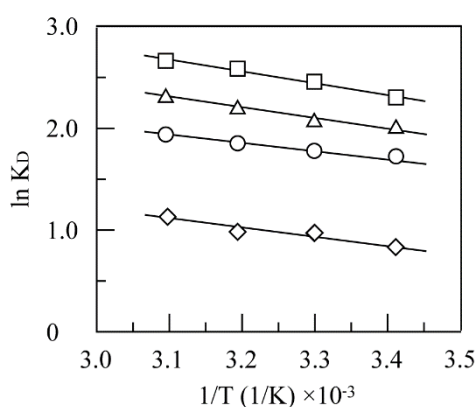


Figure S6: Changes in $\ln K_D$ value with the reciprocal temperature for adsorption of Cr(VI) ions on the 1.8KBPEI-silica beads with the contents of amino groups of 1.17 (\diamond), 1.40 (\circ), 1.76 (\triangle), and 2.17 (\square) mmol/g in an aqueous 0.20 mM $\text{K}_2\text{Cr}_2\text{O}_7$ solution at pH 3.0

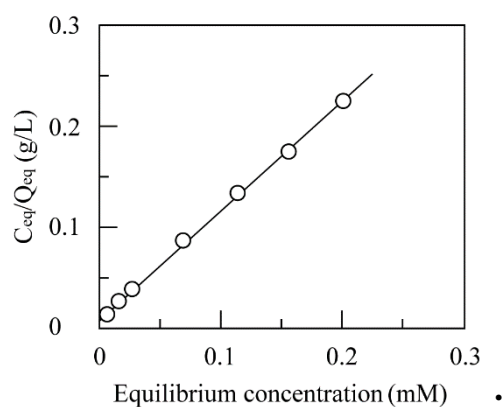


Figure S7: The linear relationship between the equilibrium concentration and C_{eq}/Q_{eq} value in Langmuir isotherm for adsorption of Cr(VI) ions on the 1.8KBPEI-silica beads with the content of amino groups of 1.76 mmol/g at pH 3.0 and 30°C.

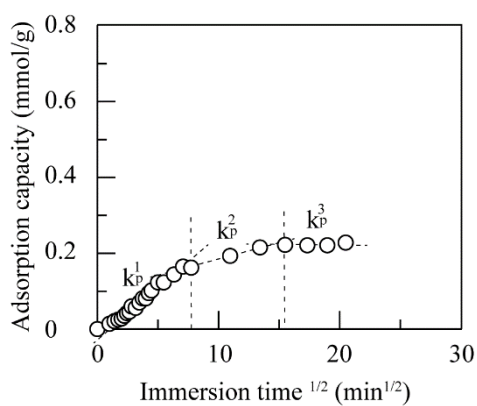


Figure S8: The Weber-Morris intraparticle diffusion plots for adsorption of Cr(VI) ions on the 1.8KBPEI-silica beads with the content of amino groups of 1.76 mmol/g in an aqueous 0.20 mM $K_2Cr_2O_7$ solution at pH 3.0 and 30°C.