Appendix 1: Langmuir Isotherms parameters for the individual REE (La, Ce, Nd, Gd, Dy and Y) for resins studied at different pH.

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| Isotherms | pH | Resins | Parameters | REE | | | | | |
| Y | La | Ce | Nd | Gd | Dy |
| Langmuir | 1.4 | Dowex 50WX8 | qmax (mmol g-1) | 0.135 | 0.212 | 0.169 | 0.169 | 0.141 | 0.141 |
| b (L mmol-1) | 83.65 | 61.02 | 85.61 | 65.87 | 82.39 | 73.28 |
| RL | 0.033 | 0.042 | 0.032 | 0.042 | 0.034 | 0.038 |
| R2 | 0.960 | 0.920 | 0.940 | 0.930 | 0.940 | 0.880 |
| Purolite C160 | qmax (mmol g-1) | 0.110 | 0.250 | 0.177 | 0.171 | 0.157 | 0.135 |
| b (L mmol-1) | 29.08 | 19.17 | 35.53 | 26.35 | 20.66 | 21.69 |
| RL | 0.089 | 0.124 | 0.075 | 0.100 | 0.125 | 0.118 |
| R2 | 0.980 | 0.970 | 0.990 | 0.980 | 0.980 | 0.970 |
| MDS 200 H | qmax (mmol g-1) | 0.121 | 0.210 | 0.173 | 0.164 | 0.140 | 0.129 |
| b (L mmol-1) | 90.42 | 65.20 | 90.11 | 75.45 | 77.01 | 77.31 |
| RL | 0.030 | 0.040 | 0.031 | 0.037 | 0.037 | 0.036 |
| R2 | 0.980 | 0.900 | 0.790 | 0.930 | 0.930 | 0.940 |
| Langmuir | 2.4 | Dowex 50WX8 | qmax (mmol g-1) | 0.126 | 0.184 | 0.148 | 0.148 | 0.143 | 0.103 |
| b (L mmol-1) | 100.4 | 75.63 | 104.2 | 73.32 | 73.62 | 132.5 |
| RL | 0.027 | 0.036 | 0.028 | 0.040 | 0.038 | 0.023 |
| R2 | 0.975 | 0.909 | 0.909 | 0.933 | 0.943 | 0.993 |
| Purolite C160 | qmax (mmol g-1) | 0.116 | 0.220 | 0.155 | 0.158 | 0.141 | 0.089 |
| b (L mmol-1) | 22.93 | 20.46 | 29.89 | 21.65 | 20.05 | 37.41 |
| RL | 0.111 | 0.121 | 0.092 | 0.124 | 0.126 | 0.079 |
| R2 | 0.964 | 0.989 | 0.922 | 0.993 | 0.998 | 0.983 |
| MDS 200 H | qmax (mmol g-1) | 0.120 | 0.202 | 0.154 | 0.157 | 0.134 | 0.101 |
| b (L mmol-1) | 83.27 | 54.46 | 90.63 | 62.84 | 74.89 | 118.4 |
| RL | 0.033 | 0.049 | 0.032 | 0.046 | 0.037 | 0.026 |
| R2 | 0.980 | 0.922 | 0.922 | 0.946 | 0.971 | 0.961 |
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| (Continued) | | | | | | | | | |
| Isotherms | pH | Resins | Parameters | REE | | | | | |
| Y | La | Ce | Nd | Gd | Dy |
| Langmuir | 3.4 | Dowex 50WX8 | qmax (mmol g-1) | 0.126 | 0.184 | 0.168 | 0.147 | 0.113 | 0.104 |
| b (L mmol-1) | 89.05 | 63.33 | 77.62 | 70.36 | 108.6 | 114.10 |
| RL | 0.030 | 0.042 | 0.034 | 0.040 | 0.027 | 0.026 |
| R2 | 0.969 | 0.889 | 0.940 | 0.909 | 0.982 | 0.984 |
| Purolite C160 | qmax (mmol g-1) | 0.114 | 0.208 | 0.189 | 0.177 | 0.088 | 0.080 |
| b (L mmol-1) | 26.42 | 21.68 | 22.06 | 15.23 | 73.27 | 70.98 |
| RL | 0.095 | 0.101 | 0.110 | 0.164 | 0.039 | 0.042 |
| R2 | 0.929 | 0.971 | 0.988 | 0.989 | 0.920 | 0.958 |
| MDS 200 H | qmax (mmol g-1) | 0.121 | 0.191 | 0.178 | 0.145 | 0.114 | 0.101 |
| b (L mmol-1) | 79.99 | 62.94 | 61.94 | 69.36 | 99.98 | 107.71 |
| RL | 0.033 | 0.042 | 0.042 | 0.041 | 0.029 | 0.028 |
|  |  |  | R2 | 0.985 | 0.910 | 0.950 | 0.934 | 0.980 | 0.981 |