

Kinetics and Mechanisms of Phosphorus Adsorption on Soils from Diverse Ecological Zones in the Source Area of a Drinking-Water Reservoir

Table S1. Sampling locations and main chemical composition of soil samples.

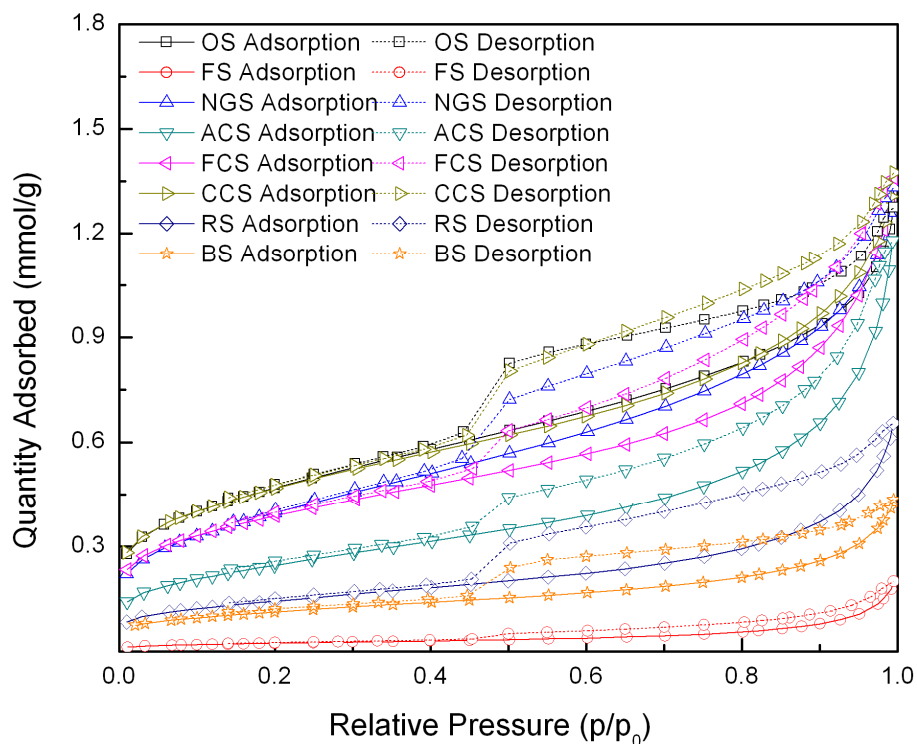
| Soil | Sampling Location |            |                     | Main Element Composition (wt. %) |       |       |       |       |       |       |       |
|------|-------------------|------------|---------------------|----------------------------------|-------|-------|-------|-------|-------|-------|-------|
|      | Longitude         | Latitude   | Description         | O                                | Si    | Al    | Fe    | Ca    | Na    | K     | Mg    |
| OS   | 111°08.253'       | 32°42.609' | orchard land        | 48.58                            | 30.45 | 10.25 | 4.951 | 0.748 | 0.507 | 2.464 | 1.076 |
| FS   | 111°25.486'       | 32°34.247' | forest land         | 50.57                            | 29.31 | 8.872 | 2.436 | 0.848 | 1.730 | 2.478 | 0.894 |
| NGS  | 111°08.142'       | 32°42.823' | natural grassland   | 48.24                            | 28.64 | 10.22 | 4.967 | 1.723 | 0.574 | 2.782 | 1.365 |
| ACS  | 111°09.570'       | 32°42.658' | abandoned cropland  | 47.75                            | 27.62 | 10.56 | 4.999 | 2.288 | 0.636 | 3.192 | 1.542 |
| FCS  | 111°27.329'       | 32°41.606' | furrowed cropland   | 46.66                            | 24.15 | 8.150 | 3.931 | 10.64 | 0.281 | 2.126 | 1.978 |
| CCS  | 111°27.372'       | 32°41.693' | cultivated cropland | 48.77                            | 29.35 | 9.288 | 4.405 | 1.798 | 0.420 | 2.604 | 1.726 |
| RS   | 111°27.794'       | 32°34.948' | riparian wetland    | 46.78                            | 27.12 | 9.513 | 7.036 | 3.878 | 1.960 | 1.050 | 1.927 |
| BS   | 111°27.797'       | 32°34.970' | bare land           | 45.45                            | 23.83 | 9.917 | 9.776 | 4.237 | 1.880 | 0.476 | 3.718 |

Notes: OS: orchard soils; FS: forest soils; NGS: natural grassland soils; ACS: abandoned cropland soils; FCS: furrowed cropland soils; CCS: cultivated cropland soils; RS: riparian soils; BS: bare soils.

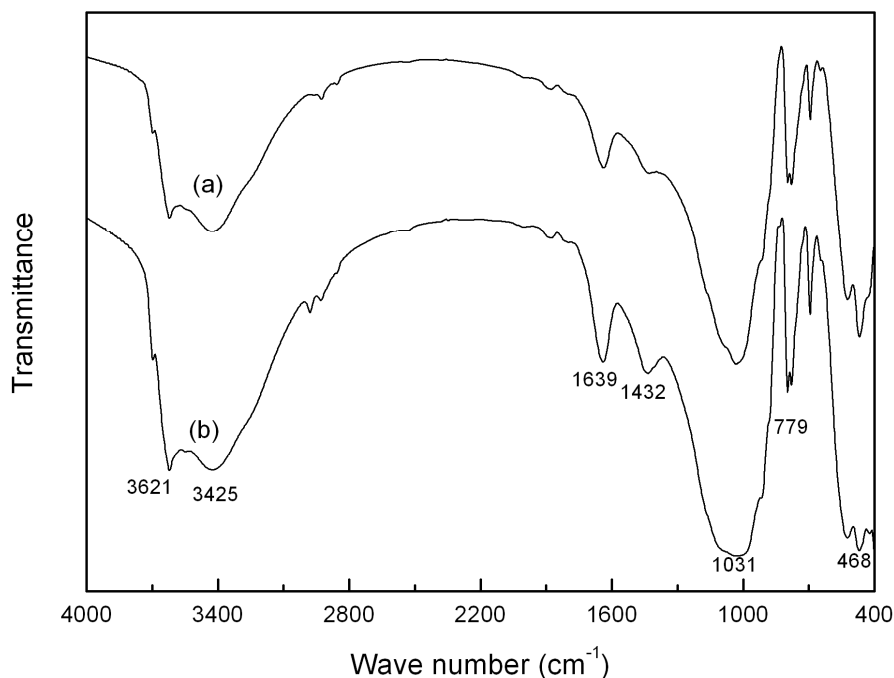
Table S2. Surface textural properties of soil samples.

| Soil | Average Pore Diameter (nm) | BET Surface Area (m <sup>2</sup> /g) | Total Pore Volume (cm <sup>3</sup> /g) |
|------|----------------------------|--------------------------------------|----------------------------------------|
| OS   | 4.90                       | 37.88                                | 0.0477                                 |
| FS   | 10.13                      | 1.93                                 | 0.0070                                 |
| NGS  | 5.30                       | 32.47                                | 0.0485                                 |
| ACS  | 7.39                       | 20.07                                | 0.0421                                 |
| FCS  | 6.35                       | 31.27                                | 0.0496                                 |
| CCS  | 5.32                       | 37.70                                | 0.0509                                 |
| RS   | 6.12                       | 11.66                                | 0.0232                                 |
| BS   | 5.63                       | 9.12                                 | 0.0156                                 |

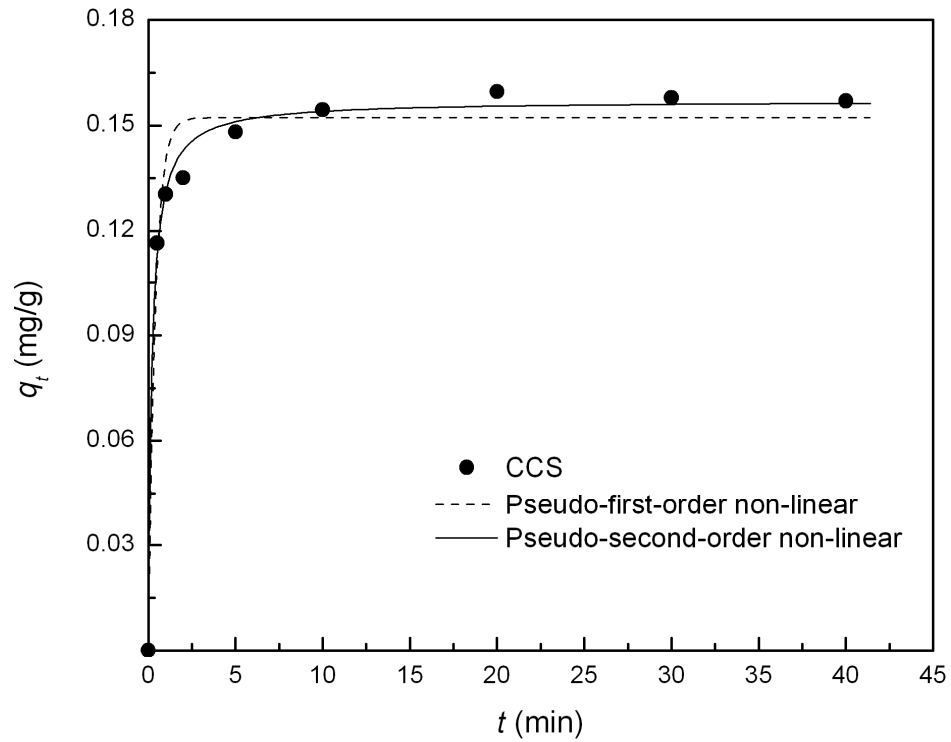
Notes: OS: orchard soils; FS: forest soils; NGS: natural grassland soils; ACS: abandoned cropland soils; FCS: furrowed cropland soils; CCS: cultivated cropland soils; RS: riparian soils; BS: bare soils.



**Figure S1.** Adsorption-desorption isotherms of N<sub>2</sub> on soil samples. Notes: OS: orchard soils; FS: forest soils; NGS: natural grassland soils; ACS: abandoned cropland soils; FCS: furrowed cropland soils; CCS: cultivated cropland soils; RS: riparian soils; BS: bare soils.



**Figure S2.** Fourier Transform infrared (FTIR) spectra of (a) original CCS soil sample; and (b) phosphorus solution treated soil sample. Notes: CCS: cultivated cropland soils.



**Figure S3.** Non-linear pseudo-first-order and pseudo-second-order kinetic plot of phosphorus adsorption on soil CCS. Notes: CCS: cultivated cropland soils.