Supplementary Information

Table S1: Isotherm model equations

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| Isotherm | Equation | Parameter |
| Freundlich | $$q\_{e}=K\_{F}C\_{e}^{{1}/{n}}$$ | $$K\_{F},{1}/{n}$$ |
| Langmuir | $$q\_{e}=\frac{q\_{max}K\_{L}C\_{e}}{1+K\_{L}C\_{e}}$$ | $$q\_{max},K\_{L}$$ |
| Sips | $$q\_{e}=\frac{q\_{s}K\_{s}C\_{e}^{n}}{1+K\_{s}C\_{e}^{n}}$$ | $$q\_{s, K\_{s}}$$ |
| n-layer BET | $$q\_{e}=q\_{m}\frac{K\_{S}C\_{e}\left[1-\left(n\_{BET}+1\right)\left(K\_{L\_{BET}}C\_{e}\right)^{n\_{BET}}+n\_{BET}\left(K\_{L\_{BET}}C\_{e}\right)^{n\_{BET}+1}\right]}{\left(1-K\_{L\_{BET}}C\_{e}\right)\left[1+\left(\frac{K\_{S}}{K\_{L\_{BET}}}-1\right)K\_{L}C\_{e}-\left(\frac{K\_{S}}{K\_{L\_{BET}}}\right)\left(K\_{L\_{BET}}C\_{e}\right)^{n\_{BET}+1}\right]}$$ | $$q\_{m},K\_{S}, K\_{L\_{BET}},n\_{BET}$$ |
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Table S2: Non-linear kinetic model equations

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| Isotherm | Equation | Parameter |
| Pseudo-first order (PFO) | $$q\_{t}=q\_{e}\left[1-exp\left(-k\_{1}t\right)\right]$$ | $$q\_{e},k\_{1}$$ |
| Pseudo-second order (PSO) | $$q\_{t}=\frac{k\_{2}q\_{e}^{2}t}{1+k\_{2}q\_{e}t}$$ | $$q\_{e},k\_{2}$$ |
| Bangham | $$q\_{t}=q\_{e}\left\{1-exp\left[-\left(k\_{b}t\right)\right]\right\}$$ | $$q\_{e}, k\_{b}$$ |