Supplementary Information

Table S1: Isotherm model equations

|  |  |  |
| --- | --- | --- |
| Isotherm | Equation | Parameter |
| Freundlich |  |  |
| Langmuir |  |  |
| n-layer BET |  |  |
|  |  |  |

Table S2: Non-linear kinetic model equations

|  |  |  |
| --- | --- | --- |
| Isotherm | Equation | Parameter |
| Pseudo-first order (PFO) |  |  |
| Pseudo-second order (PSO) |  |  |
| Elovich |  |  |
| Avrami |  |  |

Table S3: Breakthrough curve model equations

|  |  |  |
| --- | --- | --- |
| Model | Equation | Parameter |
| Thomas |  |  |
| Yoon-Nelson |  | , |
| Bohart–Adams |  |  |
| Yan |  | , |

Figure S1: Kinetic curves (a) PFO, (b) PSO, (c) Elovich and (d) Avrami

(a)

(b)

(c)

(d)

Figure S2: Breakthrough curve (a) Effect of flowrate (initial concentration = 100 mg/L and bed height = 2 cm), (b) Effect of bed height (initial concentration = 100 mg/L and flowrate = 0.5 ml/min) (c) Effect of initial MG concentration (flowrate = 2 ml/min and bed height = 2 cm)

(a)

(b)

(c)

Figure S3: Thermodynamic plot