Electronic Supplementary Information (ESI)

Controllable Conversion of Prussian blue@yeast bio-template into 3D Cage-like Magnetic Fe₃O₄@N-doped Carbon Absorbent and its Cohesive Regeneration by Persulfate Activation

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Fig. S6 Linear fits at different temperature for (a) Langmuir isotherm model and (b) Freundlich isotherm model.
| Adsorbent                                                                 | $T$ (°C) | pH  | $q_{\text{max}}$ (mg·g$^{-1}$) | References |
|---------------------------------------------------------------------------|----------|-----|-------------------------------|------------|
| gelatin/activated carbon composite beads (GE/AC)                          | 60       | 4.0 | 256.41                        | 1          |
| Fe$_3$O$_4$/RGO                                                            | 60       | 5.3 | 142.86                        | 2          |
| In-MOF@GO-2                                                               | 25       | 6.0 | 267                           | 3          |
| iron-pillared bentonite (Fe-Ben)                                          | 25       | 5.0 | 98.6                          | 4          |
| carbonaceous adsorbent (TPC)prepared from Thespusia populinia bark        | 60       | 7.0 | 77.18                         | 5          |
| Fe$_3$O$_4$@N-C (1:0.05)                                                   | 25       | 6.0 | 206.19                        | This study |
| Fe$_3$O$_4$@N-C (1:0.11)                                                   | 25       | 6.0 | 257.06                        | This study |
| Fe$_3$O$_4$@N-C (1:0.22)                                                   | 25       | 6.0 | 171.53                        | This study |
Table S2 Kinetic parameters for RhB adsorption at different initial concentration

| Kinetic models          | Parameters                          | 25  | 50  | 100 |
|-------------------------|-------------------------------------|-----|-----|-----|
|                         | $q_{e,exp}$ (mg·g$^{-1}$)           | 39.06 | 66.28 | 122.61 |
| Pseudo-first-order      | $q_{e,cal}$ (mg·g$^{-1}$)          | 8.65   | 12.20   | 11.93   |
|                         | $k_1$ (min$^{-1}$)                 | 0.0225 | 0.0262 | 0.0147  |
|                         | $R^2$                              | 0.9643  | 0.9515  | 0.9747  |
| pseudo-second-order     | $q_{e,cal}$ (mg·g$^{-1}$)          | 41.77   | 72.46   | 129.87  |
|                         | $k_2\times10^{-3}$ (g·mg$^{-1}$·min$^{-1}$) | 1.4537  | 0.5262  | 0.3576  |
|                         | $R^2$                              | 0.9977  | 0.9989  | 0.9993  |
|                         | $k_{1d}$ (mg·g$^{-1}$·min$^{-0.5}$) | 4.6083  | 5.6125  | 10.3763 |
|                         | $R^2$                              | 0.9788  | 0.9968  | 0.9841  |
| intra-particle diffusion | $k_{2d}$ (mg·g$^{-1}$·min$^{-0.5}$) | 1.7468  | 2.3845  | 3.2649  |
|                         | $R^2$                              | 0.9605  | 0.9960  | 0.9961  |
|                         | $k_{3d}$ (mg·g$^{-1}$·min$^{-0.5}$) | 0.0959  | 0.1495  | 0.9077  |
|                         | $R^2$                              | 0.8401  | 0.5680  | 0.9273  |
| T (°C) | $q_{\text{max}}$ (mg·g$^{-1}$) | $K_L$ (L·g$^{-1}$) | $R^2$ | $R_L$ | $1/n$ | $K_F$ (L·g$^{-1}$) | $R^2$ |
|-------|------------------|------------------|------|------|------|------------------|------|
| 10    | 206.61           | 0.0317           | 0.9988 | 0.14-0.39 | 0.4575 | 8.1669          | 0.9709 |
| 25    | 257.06           | 0.0343           | 0.9965 | 0.13-0.37 | 0.4874 | 8.5676          | 0.9778 |
| 40    | 262.46           | 0.0437           | 0.9954 | 0.10-0.30 | 0.4564 | 9.2963          | 0.9772 |
| 55    | 268.10           | 0.0764           | 0.9965 | 0.06-0.21 | 0.4101 | 10.265          | 0.9825 |
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