**SUPLEMENTARY DATA FOR**

**Magnetic composite adsorbents of phenolic compounds with superior corrosion resistance**

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Figure S1. Carbonization yield of impregnates with different contentof carbon-encapsulated iron nanoparticles.



Figure S2. Thermogravimetric curves (in N2-O2) of composites: (a) Sucrose(KOH), (b) Glucose(KOH), (c) sucrose(ZnCl2), (d) glucose(ZnCl2) with different CEINs content.





Figure S3. Total synthesis yield (a) and Fe content in final composite vs CEINs content in initial mixture (b).



Figure S4. Hysteresis loops of (a) sucrose(KOH), (b) glucose(KOH), (c) sucrose(ZnCl2) and (d) glucose(ZnCl2).



Figure S5. Magnetization saturation vs Fe content in composites.



Figure S6. Raman spectra of composites with 9 wt. % of CEINs in comparison with pristine CEINs and commercial activated carbon.



Figure S7. Powder XRD patterns acquired for composites with 9 wt. % of CEINs and pure CEINs

Table S1. Chemical composition via EDX spectroscopy (weight %).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Material | Carbon Kα 0.277eV | Oxygen Kα 0.525eV | Iron Kα 6.398eV | Zinc Lα 1.012eV | Chlorine Kα 2.621eV | Potassium Kα 3.312 |
| CEINs | 73.81% | 2.75% | 23.44% | N.D. | N.D. | N.D. |
| Glucose(KOH)-9% | 80.43% | 13.74% | 5.82% | N.D. | N.D. | N.D. |
| Glucose(ZnCl2)-9% | 85.01% | 3.91% | 7.80% | 1.13% | 2.15% | N.D. |
| Sucrose(KOH)-9% | 90.57% | 4.57% | 2.06% | N.D. | N.D. | 2.80% |
| Sucrose(ZnCl2)-9% | 86.83% | 8.21% | 3.42% | 0.45% | 1.09% | N.D. |

N.D. - not detected

|  |  |
| --- | --- |
| Graph1.TIF | Graph2.TIF |

Figure S8. EDX spectra.



Figure S9. FTIR spectra of composites with 9 wt. % of CEINs.



**a) b)**

**c) d)**

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Figure S10. Nitrogen adsorption/desorption isotherms at 77K onto sucrose(KOH) with different CEINs content. (a) 9 wt. %, (b) 16wt. %, (c) 23wt. %, (d) 44wt. %.



**a) b)**

**c) d)**



Figure S11.Nitrogen adsorption/desorption isotherms at 77K onto glucose(KOH) with different CEINs content. (a) 9 wt. %, (b) 16wt. %, (c) 23wt. %, (d) 44wt. %.



**a) b)**

**c) d)**

31.TIF

Figure S12.Nitrogen adsorption/desorption isotherms at 77K onto sucrose(ZnCl2) with different CEINs content. (a) 9 wt. %, (b) 16wt. %, (c) 23wt. %, (d) 44wt. %.

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**a) b)**

**c) d)**

Figure S13.Nitrogen adsorption/desorption isotherms at 77K onto glucose(ZnCl2) with different CEINs content. (a) 9 wt. %, (b) 16wt. %, (c) 23wt. %, (d) 44wt. %.

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Figure S14.Nitrogen adsorption/desorption isotherms at 77K onto (a) sucrose(KOH)-0, (b) glucose(KOH)-0, (c) sucrose(ZnCl2)-0, (d) glucose(ZnCl2)-0.



Figure S15. Specific surface area vscontent of CEINs content in composites.

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Figure S16. TEM image of pristine CEINs.

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Figure S17. Relationship between adsorption kinetics rate and specific surface area (phenol adsorption).



Figure S18. Intra-particle diffusion plots for (a, b) 2-chlorophenol and (c, d) 4-chlorophenol.



Figure S19. Intra-particle diffusion plots for phenol adsorption onto (a) sucrose(KOH), (b, c) sucrose(ZnCl2), (d) glucose(KOH) and (e) glucose ZnCl2 (CEINs content in brackets).

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Figure S20. Intra-particle diffusion plots for phenol adsorption onto materials without CEINs.



Figure S21. Adsorption isotherms of phenol onto (a) sucrose(KOH)-9, (b) glucose(KOH)-9, (c) sucrose(ZnCl2)-9, (d) glucose(ZnCl2) after three adsorption/regeneration cycles.



Figure S22. Adsorption isotherms of 2-chlorophenol onto (a) sucrose(KOH)-9, (b) glucose(KOH)-9, (c) sucrose(ZnCl2)-9, (d) glucose(ZnCl2) after three adsorption/regeneration cycles.



Figure S23. Adsorption isotherms of 4-chlorophenol onto (a) sucrose(KOH)-9, (b) glucose(KOH)-9, (c) sucrose(ZnCl2)-9, (d) glucose(ZnCl2) after three adsorption/regeneration cycles.