Supporting Information

Carbon and Tin based polyacrylonitrile hybrid architect solid phase microextraction fiber for the detection and quantification of antibiotic compounds from aqueous environmental systems.

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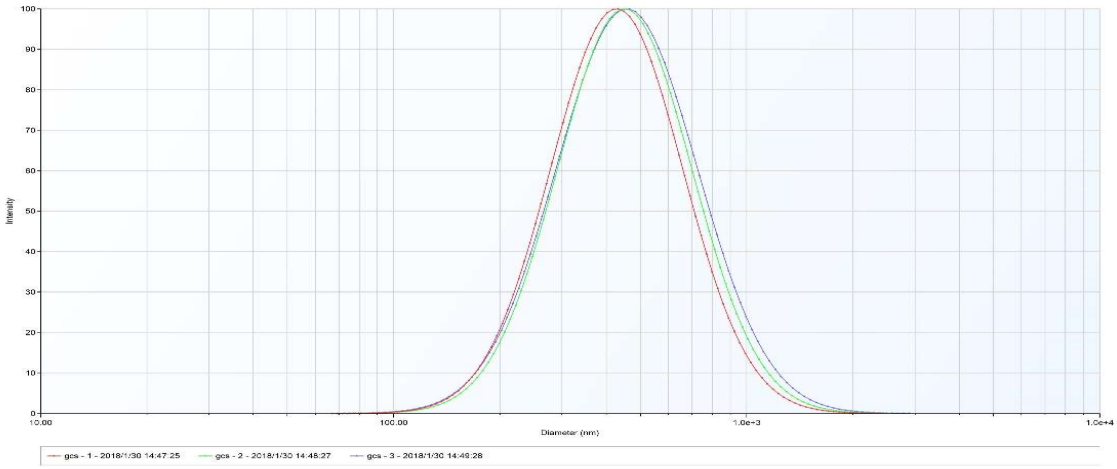
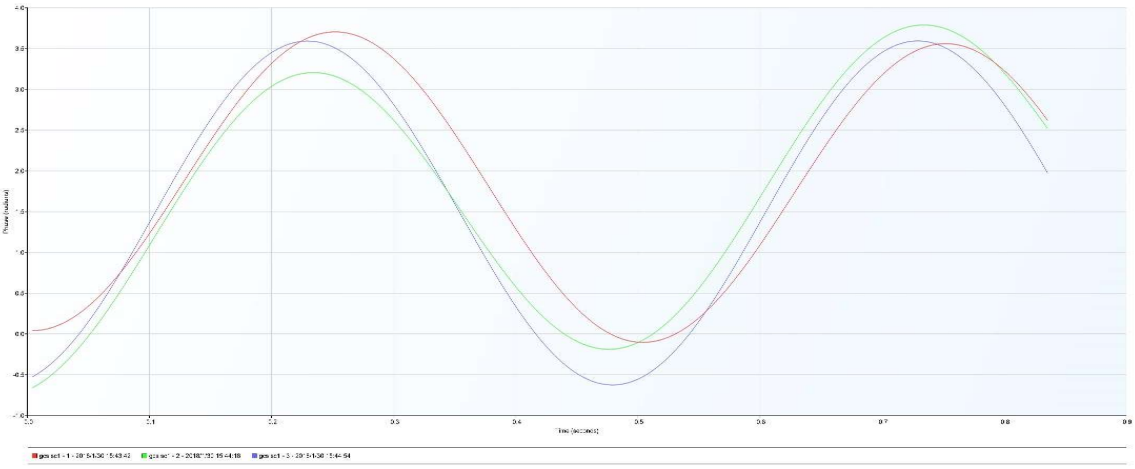
Figure 5

Table 4

Figure S1: Image of (a) effective diameter and (d) zeta potential of GCS.



(A)



(B)

Figure S2: XPS spectra of GCT.

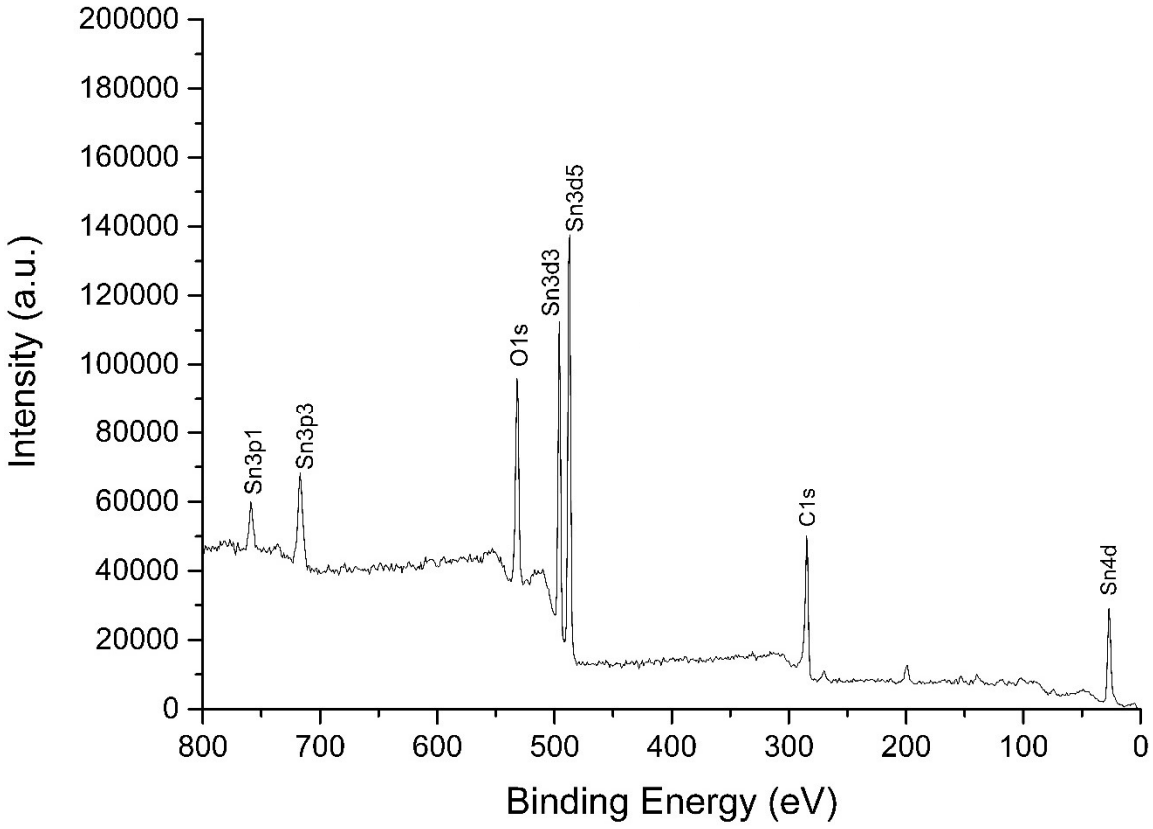


Figure S3. selected area electron diffraction (SAED) pattern of GCT

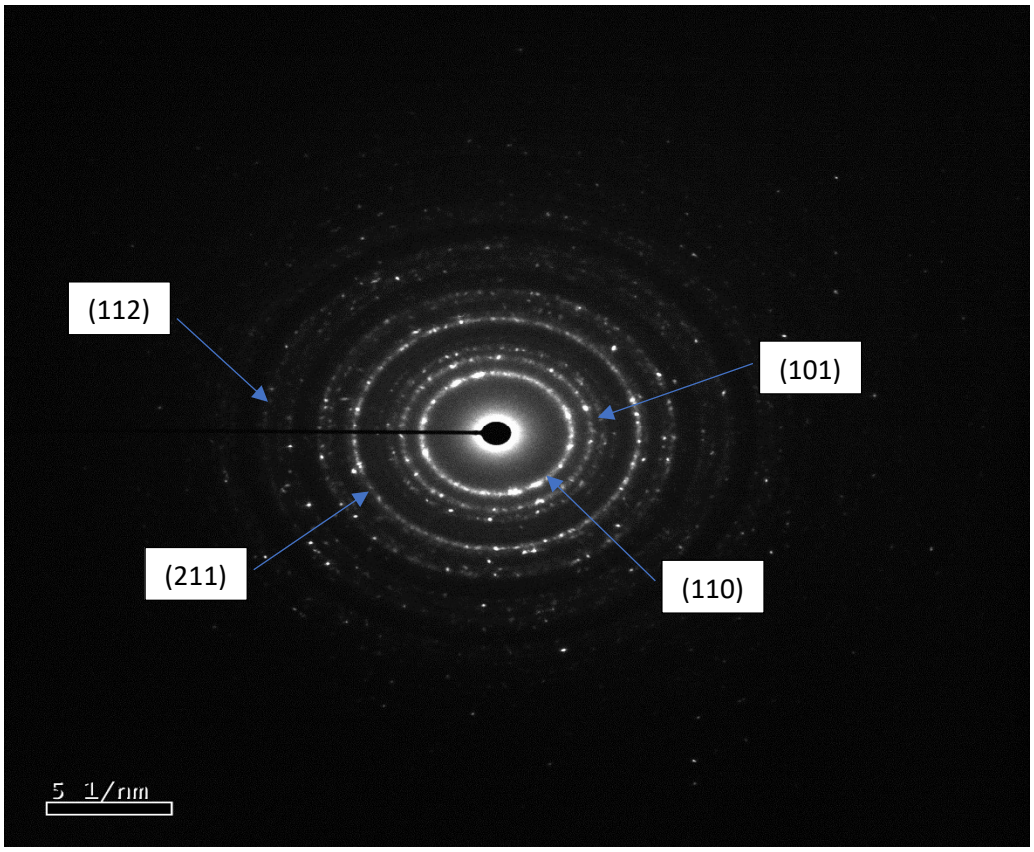
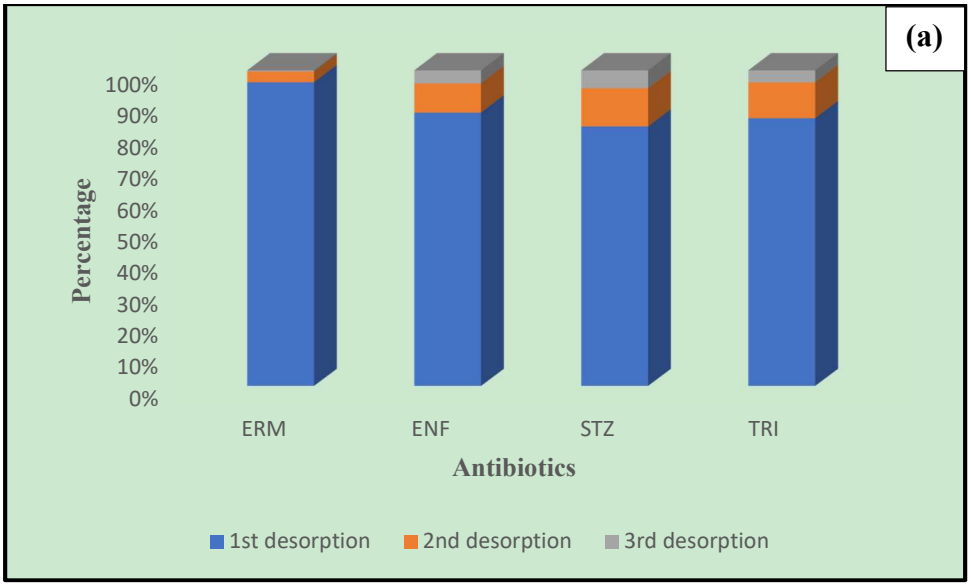


Figure S4. (A) Carry over experiment and (B)Optimization of solvent system.



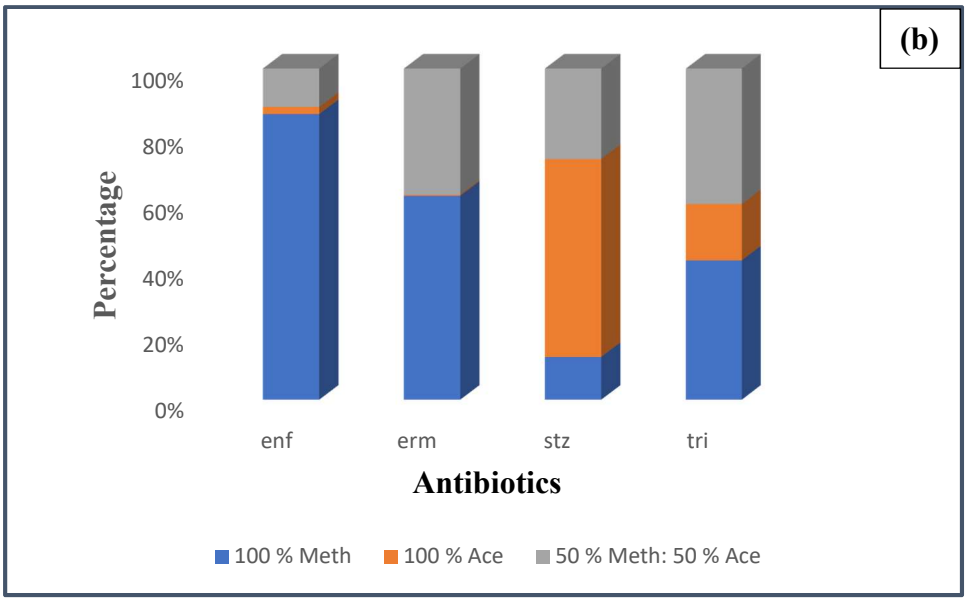


Figure S5: Fabrication of GCT Hybrid Architecture

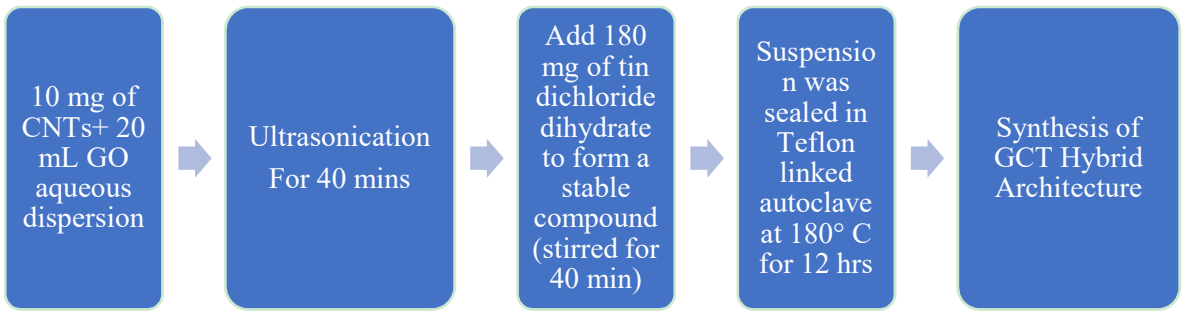


Table S1: Cost analysis to prepare SPME (N=360) fiber.

(A) Solid compound	Amount (gm)	Unit Price (RMB)	amount used (gm)	Price (RMB)		
Carbon nanotubes	1	3078	0.12	369.36		
Graphene oxide	1	1799	0.24	431.76		
Tin dicholoride dihydrate	500	147	2.16	0.63		
Polyacrylonitrile	100	2574	1.2	30.888		
NaOH	500	15	0.2	0.006		
Total cost				832.649		
(B) Liquid compound	Amount (mL)	Price (RMB)	Used (ml)	Price (RMB)		
DMF	500	26	12	0.62		
Hydrochloric acid	500	19	0.41	0.02		
Total cost				0.64		
(C) Equipment	Ampere (A)	Volts (V)	Watts (W)	Time (hour)	Unit cost (RMB)	Cost (RMB)
Centrifuge	40	220	8800	1	0.6	0.6
Sonication	48	230	11040	1.66	0.6	0.36
Hot air oven			320	12	0.6	7.2
Total cost						8.16
(D) Fiber material	Length	Unit Price	No. of fiber	Length of fiber (cm)	Length of fiber used (m)	Price (RMB)
Quartz fiber	1 m	120	360	3	10.8	1296
	RMB					
(E) Net Cost	2137.45					
(F) Other overhead cost=10% of the net cost	213.745					
(G) Total cost	2351.2					
Number of fibers (N)	Net cost (RMB)	1 Fiber cost (RMB)				
360	2351.2	6.53				

The break-up cost for each step and the total cost for the preparation of 360 fiber in Chinese Renminbi (RMB) have been calculated stepwise to give an idea about the approximate cost involved in the present investigation. So, the approximate cost of fiber is (Total cost/360 fiber) **6.53 RMB or 0.97 USD** which is much cheaper than the commercial fiber (1000 RMB or 149 USD).

Table S2: Comparison of antibiotic detection by different methods

Antibiotic	Medium	Methods	LOD	References
Enrofloxacin	Milk	Glucose meter	5 ng/mL	Kwon et al.(2018) [1]
	Water	DSPE-HPLC	0.36 µg/L	Lu et al (2019)[2]
	Water	MEKC	1 µg/L	Brompoj (2018)[3]
	Water	HPLC-DAD	0.1 mg/L	Danijela (2010)[4]
	Water	SPME-LC-MS/MS	6.6 ng/L	**This study**
Sulfathiazole	Water	Immunosensor	0.11 µg/L	Dolors (2010)[5]
	Water	HPLC–MS/MS	0.29 ng/L	Guiju (2019)[6]
	Sea water	MS-MS	1.40 ng/mL	Sara (2015)[7]
	Sea Water	UV	2.88 µg/mL	Sara (2015)[7]
	Water	HPLC-DAD	0.20 µg/L	Kochaporn [8]
	Water	HPLC-DAD	4.48 µg/L	Antonio [9]
	Water	SPME-LC-MS/MS	7.69 ng/L	**This study**
Erythromycin	Water	HPLC–MS/MS	0.04 ng/L	Anwar (2018)[10]
	Water	HPLC–MS/MS	0.10 ng/L	Nadia (2017)[11]
	Water	HPLC–MS/MS	0.10 ng/L	Hu (2014)
	Water	HPLC–MS/MS	3 ng/L	Hu (2014) [12]
	Water	HPLC–MS/MS	4 ng/L	Thomas (2004)[13]
	Water	HPLC–MS/MS	10 ng/L	Martin (2003) [14]
	Water	SPME-LC-MS/MS	1.36 ng/L	**This study**
Trimethoprim	Water	SPE-LC–MS/MS	3.1 ng/L	J.Rossmann(2014)[15]
	Water	HPLC-DAD	0.5 mg/L	Danijela (2010)[4]
	Water	HPLC–MS/MS	10 ng/L	Martin (2003)[14]
	Water	SPME-LC-MS/MS	0.9 ng/L	**This study**

Table S3: Optimization of adsorbent onto the QFs surface

Attachment of highest amount of adsorbent	Amount of PAN+DMF	Uniformity of slurry
20 mg	1.1 g	Visually uniform
50 mg	1.1 g	Visually uniform
75 mg	1.1 g	Visually not uniform. Too much compound makes the slurry saturated and hard, no more viscous solution
100 mg	1.1 g	Visually not uniform. Too much compound makes the slurry saturated and hard, no more viscous solution

Abbreviations:

DSPE: Dispersive solid-phase extraction
MEKC: micellar electrokinetic chromatography
HPLC-DAD: high-performance liquid chromatography with diode array

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