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Simple route for the generation of differently functionalized PVC@graphene-polyaniline fiber bundles for the removal congo red from wastewater

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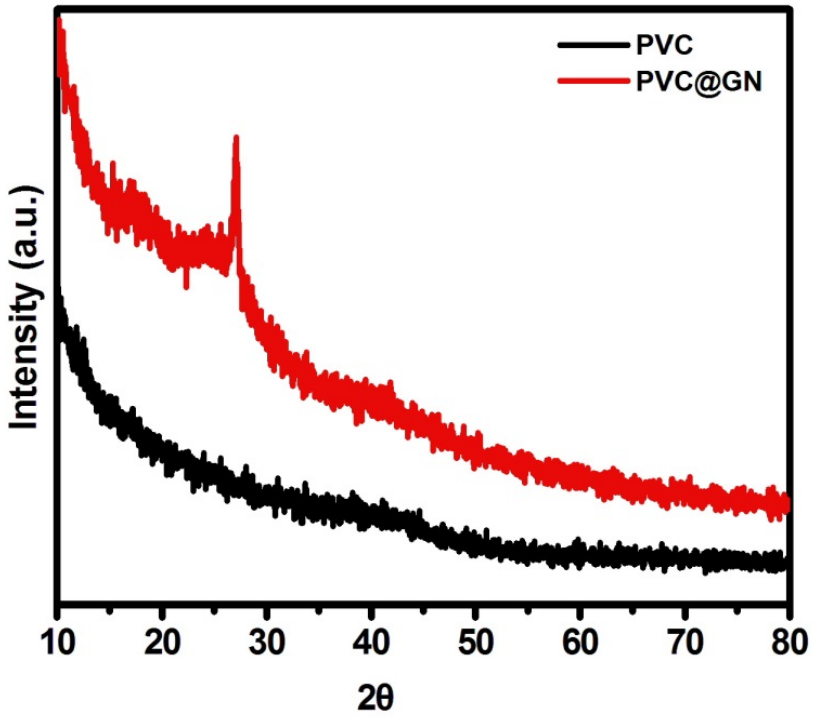

Fig. S1 XRD pattern of PVC and PVC@GN fibers.

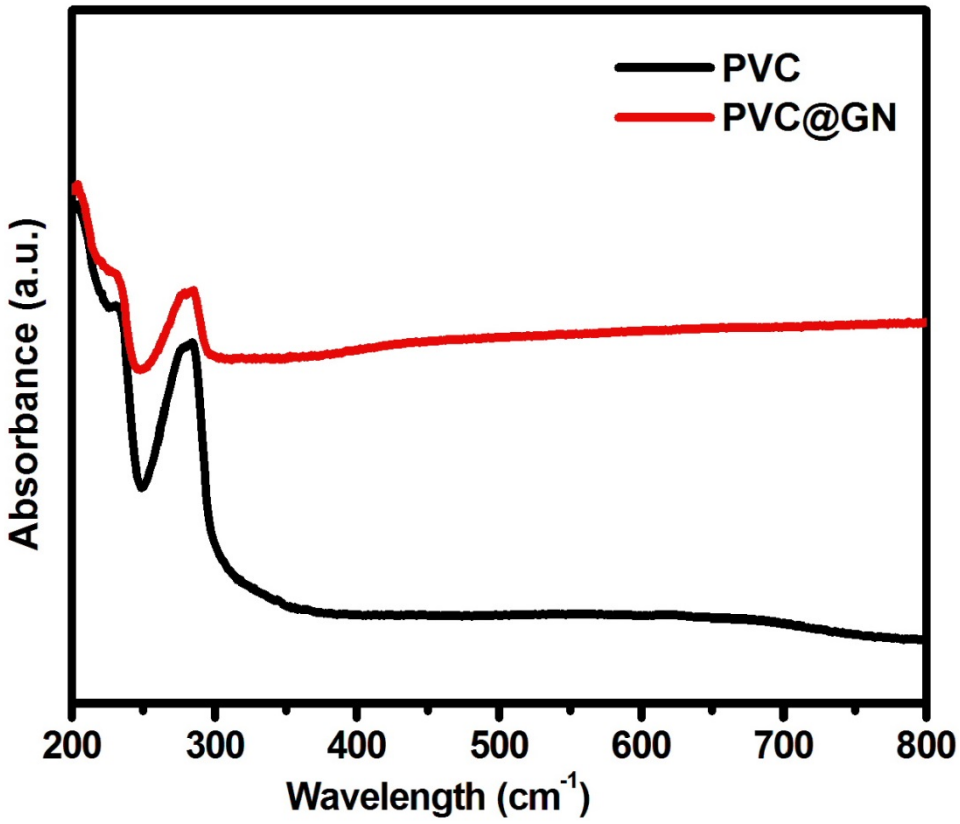

Fig. S2 UV-vis diffuse absorbance spectra of PVC and PVC@GN fibers.

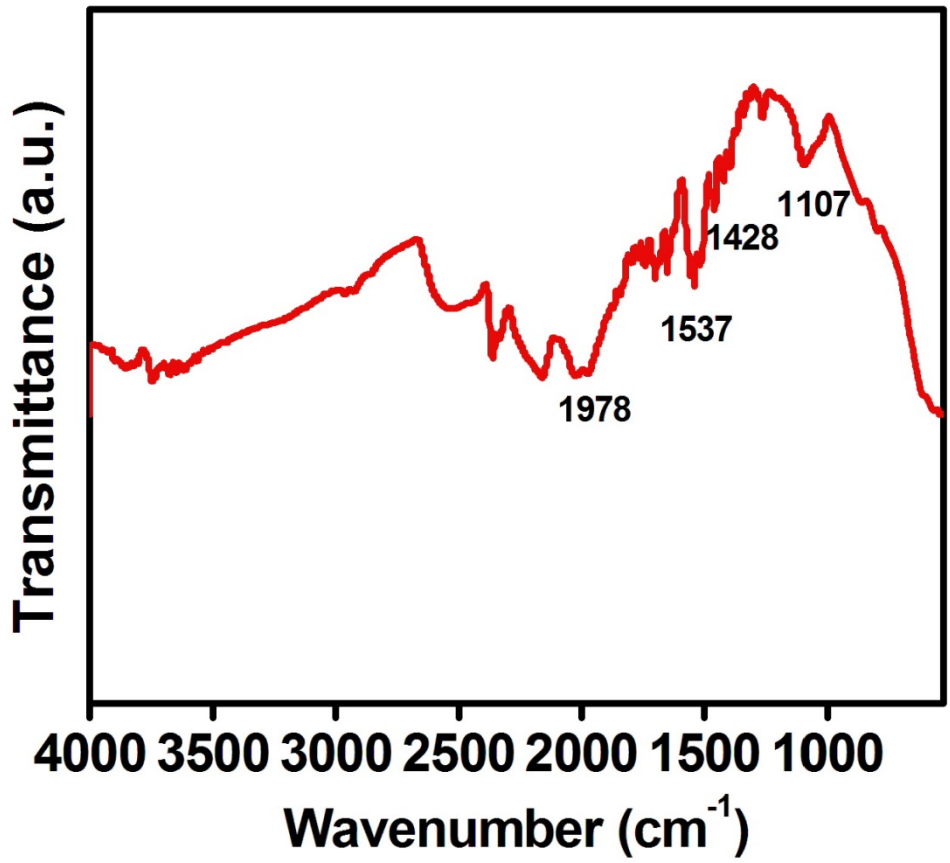

Fig. S3 FTIR spectra of Congo red dye

Table S1 Thermodynamic parameters for the adsorptive removal of CR onto PVC@GN-Pani-*b*, PVC@GN-Pani-*a* and PVC@GN-Pani-*s* fibers

Fibers	ΔG°(kJ/mol)			ΔH°	ΔS°	R^2
	30 °C	40 °C	50 °C	(kJ/mol)	(J/mol K)	
PVC@GN-Pani-*b*	−0.2633	0.561	1.726	−29.348	−99.094	0.989
PVC@GN-Pani-*a*	−0.947	−0.364	1.196	−32.432	−107.724	0.983
PVC@GN-Pani-*s*	−2.637	−1.852	−0.171	− 38.601	− 122.29	0.960

Table S2 Adsorption isotherm parameters for the removal PVC@GN-Pani-*b*, PVC@GN-Pani-*a* and PVC@GN-Pani-*s* fibers.

	Langmuir isotherm model			**Freundlich isotherm model**		
Fibers	q_m (mg g^{-1})	b (L mg^{-1})	R^2	K_F ($mg^{1-1/n}$ $L^{1/n}g^{-1}$)	n	R^2
PVC@GN-Pani-*b*	26.315	0.0440	0.982	1.660	1.512	0.974
PVC@GN-Pani-*a*	31.250	0.0355	0.973	1.907	1.385	0.849
PVC@GN-Pani-*s*	40.00	0.113	0.945	5.556	2.320	0.989

Table S3 Comparison of adsorption capacities of various adsorbents for Congo red removal from aqueous solution

Adsorbent	Adsorption capacity (mg/g)	Reference
Rice husk ash	7.047	1
Coir pith carbon	6.7	2
Bael shell carbon	98.03	3
Fe_3O_4@graphene nanocomposite	33.66	4
Rice bran	14.6	5
Bentonite	19.9	6
4-Vinyl pyridine grafted poly (ethylene terephthalate) fibers	18.1	7
Activated carbon (Laboratory grade)	1.88	8
Bagasse fly ash	11.89	8
Montmorillonite	12.70	9
Sugarcane bagasse	38.2	10
Polypyrrole–polyaniline nanofibres	270.27	11
PVC@GN-Pani-*b*	26.315	This study
PVC@GN-Pani-*a*	31.250	This study
PVC@GN-Pani-*s*	40.00	This study

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