Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Hydrophilic hollow carbon nanocapsules for high-capacity adsorptive removal of cationic dyes in aqueous systems

Ray-Tung Chiang,[a,b] Ray-Kuang Chiang,[a], and Fuh-Sheng Shieu[b],**

[a]Nanomaterials Laboratory, Department of Materials Science and Engineering, Far East University, Hsing-Shih, Tainan 74448, Taiwan, and [b]Department of Materials Science and Engineering, National Chung Hsing University, Taichung 402, Taiwan

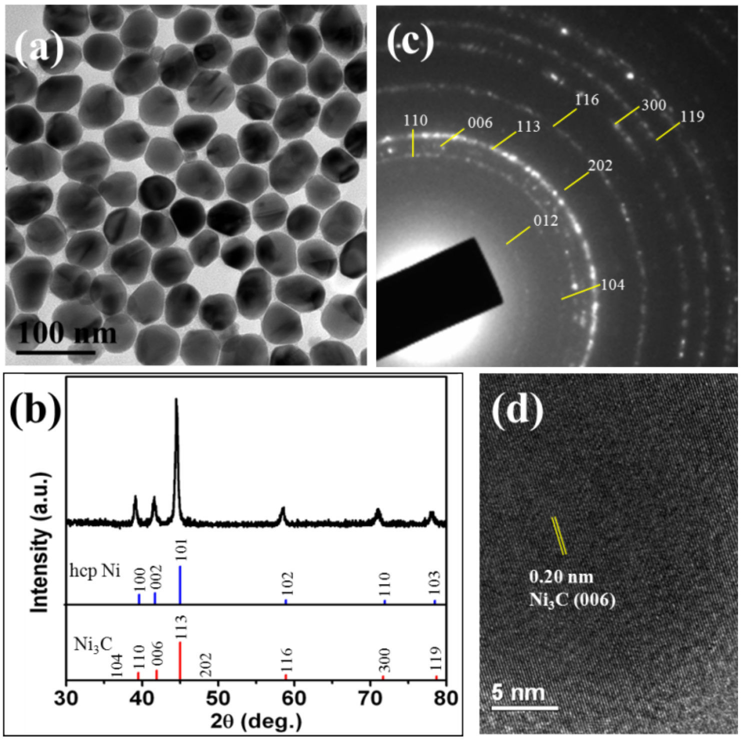

Fig. S1 (a) TEM image, (b) XRD pattern, (c) SAED image and (d) HRTEM image of as-synthesized Ni_3C products.

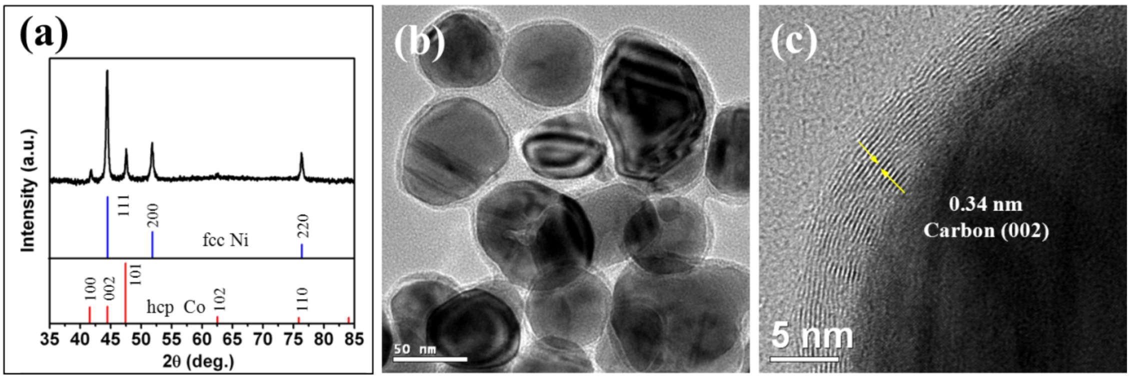

Fig. S2 (a) XRD pattern, (b) TEM image and (c) HRTEM image of Ni_3C NP products decomposed at 500^{o}C for 10 min.

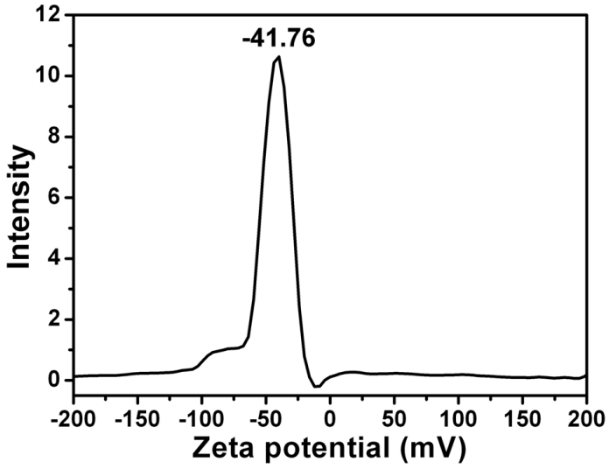

Fig. S3 Zeta potential of HCNs in DI water (V = 20 mL, m = 1 mg, pH = 6.0 ± 0.1).

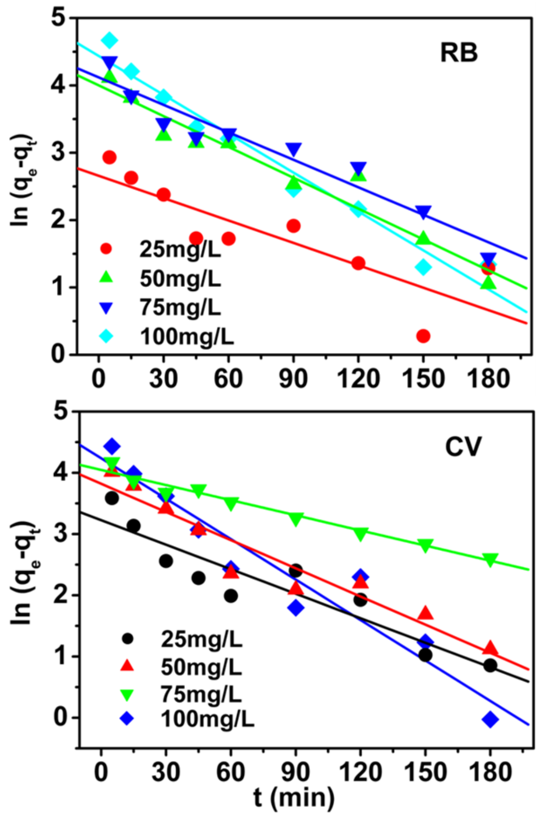

Fig. S4 Plots of pseudo-first-order kinetic model for adsorption of RB (upper) and CV (lower) dyes on HCNs.

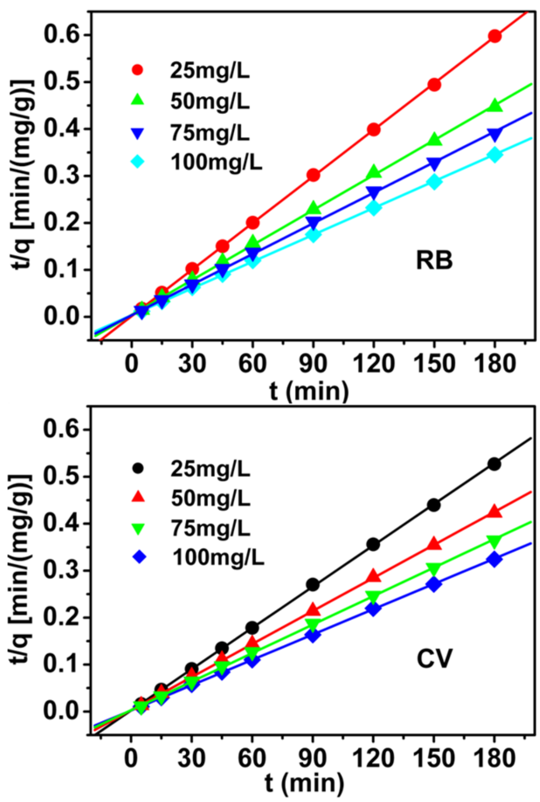

Fig. S5 Plots of pseudo-second-order kinetic model for adsorption of RB (upper) and CV (lower) dyes on HCNs.

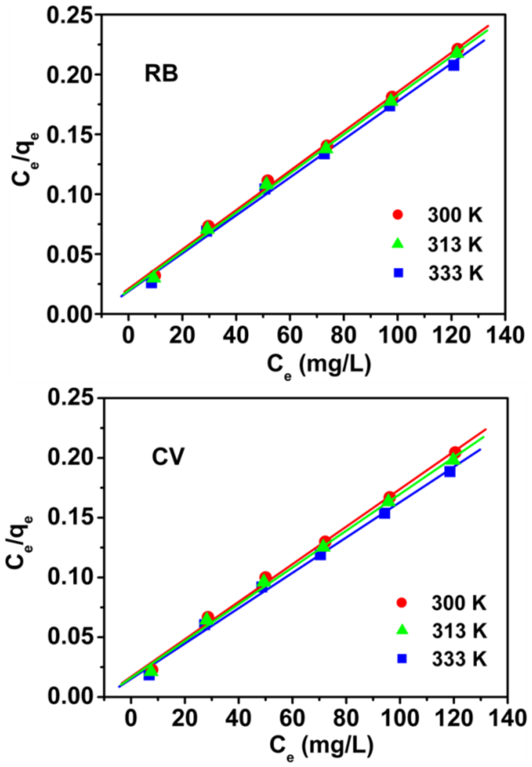

Fig. S6 Plots obtained from Langmuir isotherm model for adsorption of RB (upper) and CV (lower) dyes on HCNs.

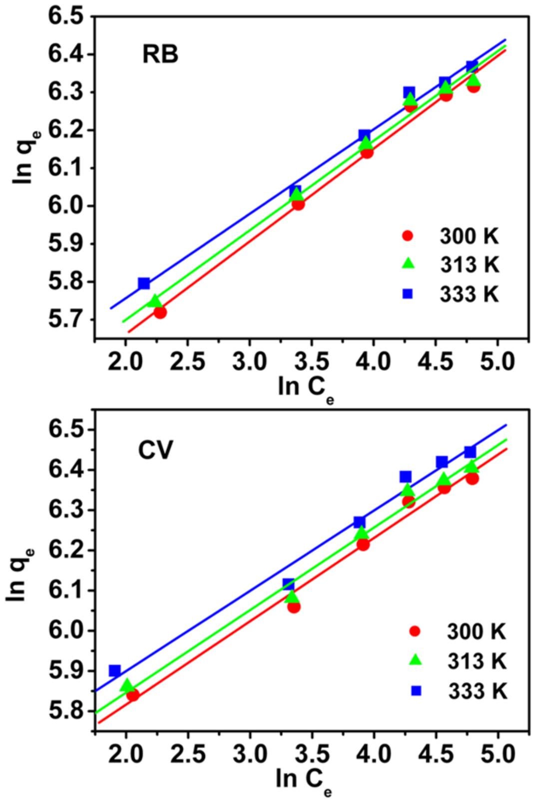

Fig. S7 Plots obtained from Freundlich isotherm modal for adsorption of RB (upper) and CV (lower) dyes on HCNs.

Table S1 Comparison of maximum adsorption capacity of HCNs and other carbonaceous adsorbents for RB and CV dyes.

Adsorbent	Adsorbate	C_{0-max} (mg/L)	q_m (mg/g)	Refs.
HCNs	RB	150	628.93	This work
Exfoliated graphene oxide	RB	10	1.24	1
Pyrolytic tire char activated carbon	RB	150	312.5	2
Bagasse pith activated carbon	RB	600	263.85	3
Phoenix sylvestric leave activated carbon	RB	60	51.55	4
Graphene sponge	RB	~95.8	72.5	5
Sago waste activated carbon	RB	40	16.2	6
Cashew husk based activated carbon	RB	350	250	7
HCNs	CV	150	675.68	This work
Phosphoric acid activated carbons	CV	180	60.4	8
Sulfuric acid activated carbons	CV	180	85.84	8
Tomato paste waste activated carbon	CV	350	68.97	9
Jute fiber carbon	CV	110	27.99	10
Sulfuric acid activated carbons	CV	100	64.87	11
Zinc chloride activated carbons	CV	100	61.57	11
Waste apricot activated carbon	CV	400	91.74	12
Apple rind activated carbon	CV	100	19.8	13

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