Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

High Drug Loading System of Hollow Carbon Dots – Doxorubicin: Preparation, *in-vitro* Release and pH-Targeted Research

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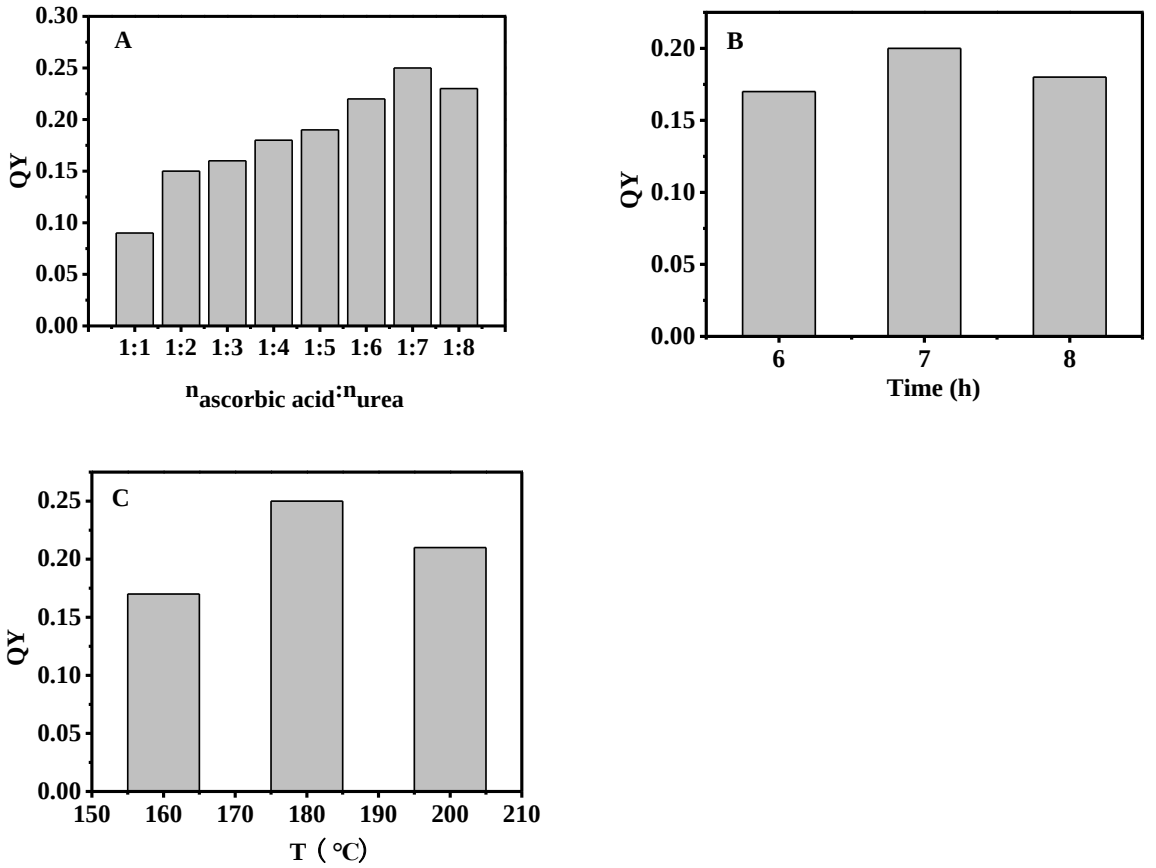


Fig.S1 Effects of (A) the molar ratios of raw materials, (B) hydrothermal time and (C) hydrothermal temperature on quantum yield of HCDs

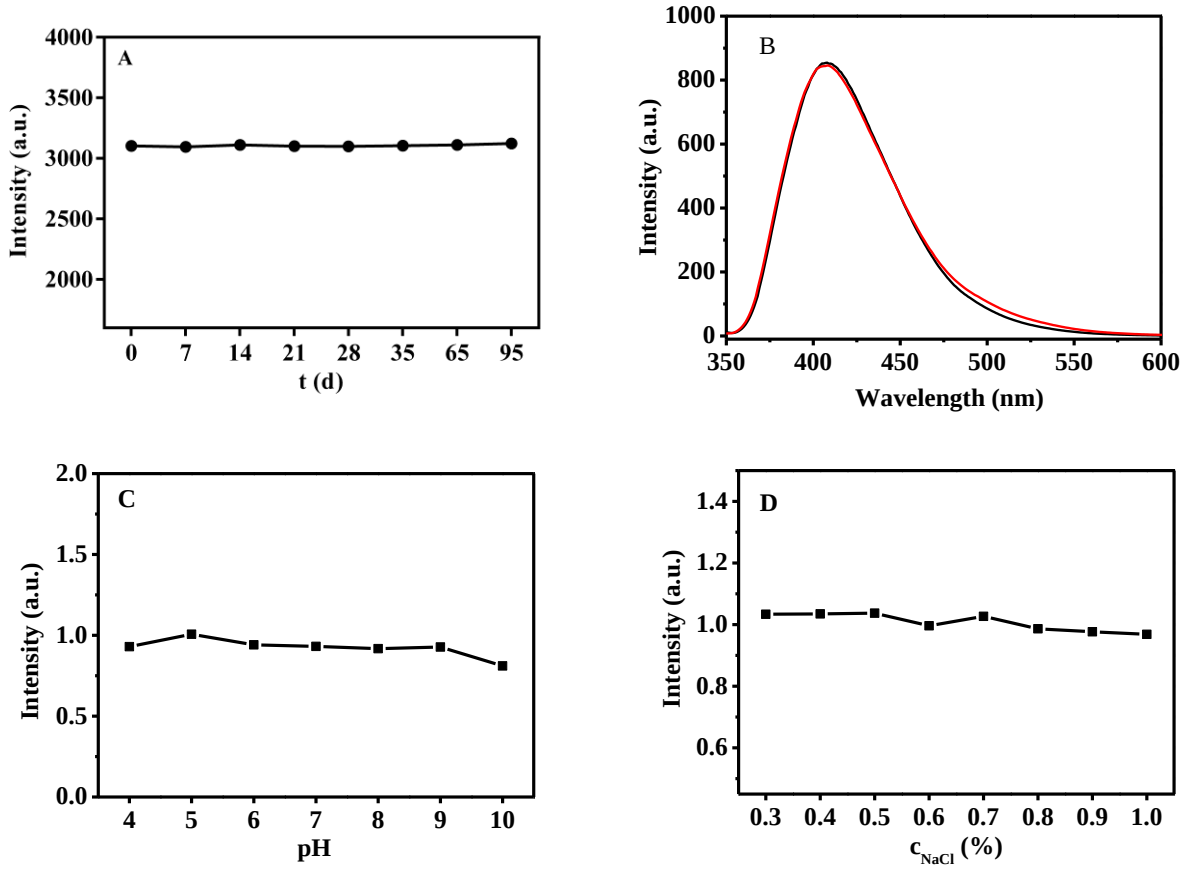
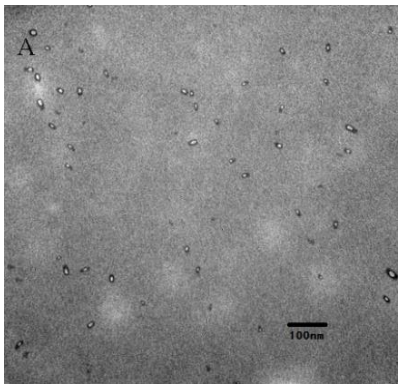


Fig. S2 HCDs stability: (A) fluorescence intensity of HCDs at different time (excitation at 360 nm), (B) fluorescence spectra of HCDs before (black trace) and after HCDs being exposed to the UV light (red trace), (C) fluorescence intensities of HCDs at different pH conditions and (D) different concentrations of NaCl (0.3%, 0.4%, 0.5%, 0.6%, 0.7%, 0.8%, 0.9%, 1.0%).



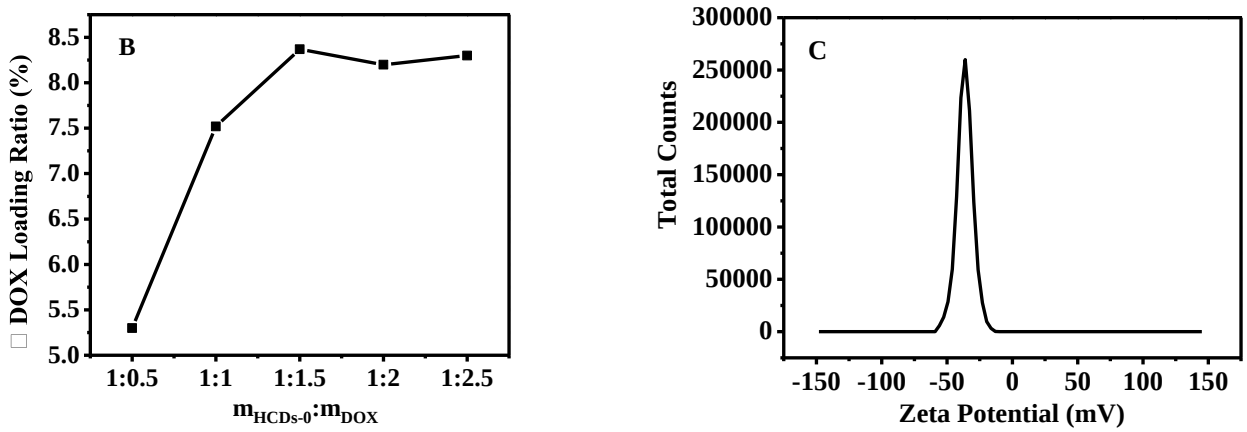


Fig. S3 Characterization of HCDs-0: (A) The TEM micrograph, (B) Effect of mass ratio of HCDs-0 and DOX on DOX loading, (C) Zeta potential.

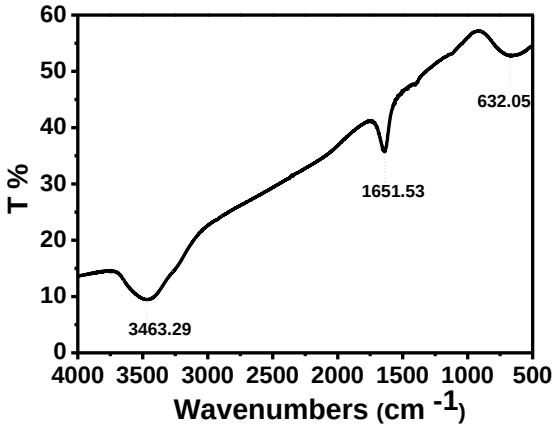


Fig. S4 FT-IR spectrum of HCDs-DOX

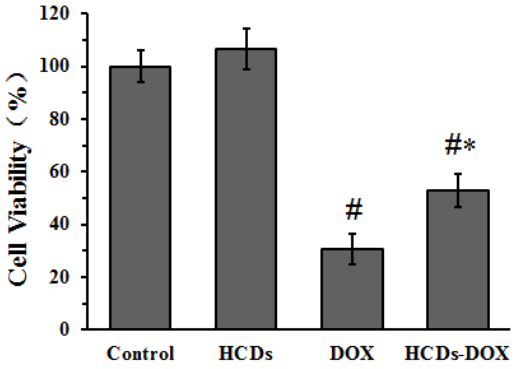


Fig. S5 The cell viability of A549 cells detected by MTT assay treated with HCDs, free DOX or HCDs-DOX (DOX concentration was 10 μg/mL) for 48 h, data are presented as the mean±standard deviation (SD; n = 6), $^{\#}P<0.01$ compared to non-treated controls, $^{*}P<0.05$ compared to DOX only.

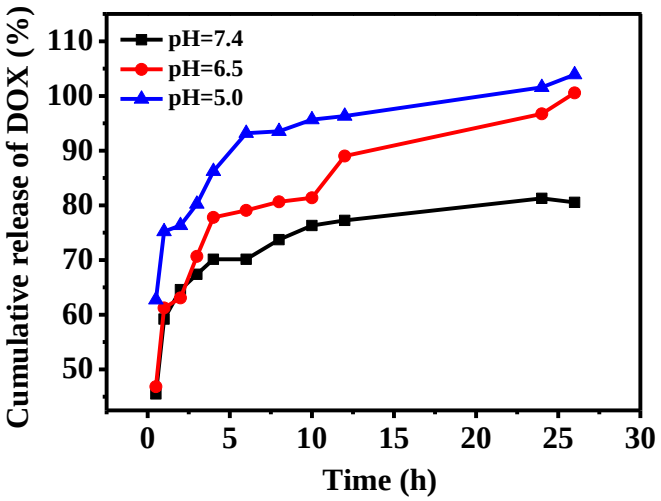


Fig. S6 *in vitro* release of DOX in PBS buffer (pH = 7.4, 6.5, and 5.0) at 37 °C.

Table S1 Fitting results of HCDs-DOX by different release models in PBS buffer (pH=5.0) (F = cumulative release amount, k = release constant, t = time).

Models	Equations	R^2
Zero - order kinetics	F = 23.26 + 0.79*t	0.827
First - order kinetics	F = 70.02*(1 - exp(-0.069*t))	0.951
Weibull models	F = 85.86*(1 - exp(-(0.042*(t-1.01))^0.59))	0.976
Higuchi models	F=8.44*(t^0.5)+6.63	0.958
Ritger-Peppas models	F =14.17*(t^0.39)	0.967

Table S2 Fitting results of HCDs-DOX by different release models in plasma (F = cumulative release amount, k = release constant, t = time).

Models	Equations	R^2
Zero - order kinetics	F = 12.83 + 0.29*t	0.924
First - order kinetics	F = 31.96*(1 - exp(-0.063*t))	0.799
Weibull models	F = 114.40*(1 - exp(-(0.0013*(t+2.51))^0.46))	0.995
Higuchi models	F=3.24*(t^0.5)+5.92	0.994
Ritger-Peppas models	F =7.43*(t^0.35)	0.991

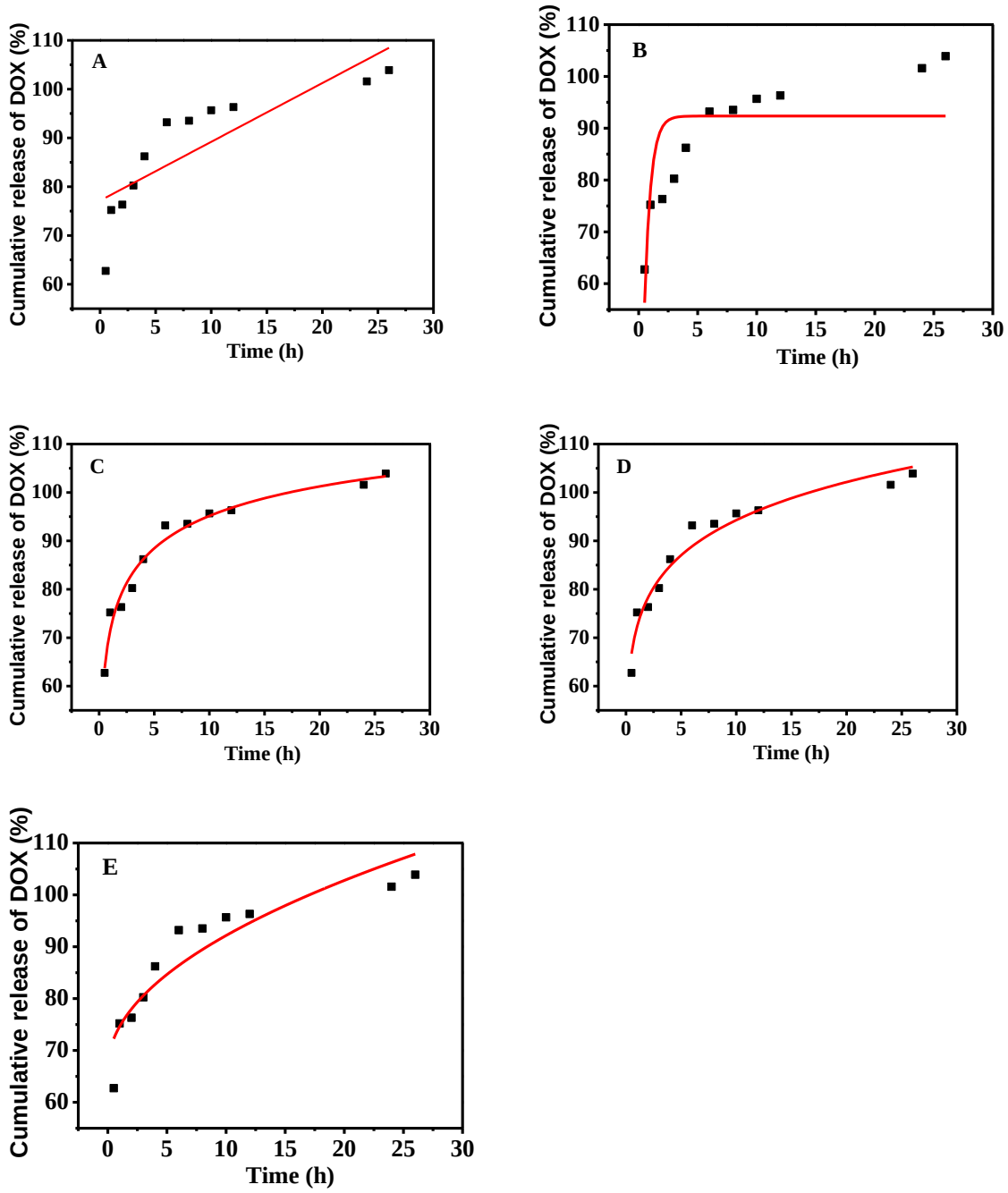


Fig. S7 Profiles of DOX release model: (A) Zero - order kinetics, (B) First - order kinetics, (C) Weibull models, (D) Riger–Peppas models and (E) Higuchi models.

Table S3 Fitting results of DOX by different release models in PBS buffer (pH=5.0) (F = cumulative release amount, k = release constant, t = time).

Models	Equations	R^2
Zero - order kinetics	F = 77.15 + 1.20*t	0.663
First - order kinetics	F = 92.35*(1 - exp(-1.88*t))	0.544
Weibull models	F = 120.56*(1 - exp(-(0.67*(t-0.066))^0.23))	0.963
Higuchi models	F=8.12*(t^0.5)+66.52	0.958
Ritger-Peppas models	F =72.26*(t^0.12)	0.848