

Supplementary material

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Gamma ray assisted modification of carbon quantum dots/polyurethane nanocomposites: structural, mechanical and photocatalytic study

Number of pages – 4, number of figures – 4, number of tables – 3;

Table S1. The content of elements and characteristic bonds identified in gamma-irradiated hCQD-PU samples

Name	hCQD-PU-1 (atomic %)	hCQD-PU-10 (atomic %)	hCQD-PU-200 (atomic%)
N1s	5.8	4.7	4.1
C1s	85.2	90.4	87.1
O1s	6.5	4.8	8.7
sp2	28.9	39.9	49.2
sp3	55.2	50.1	32.8
C-O	10.2	4.4	13
C = O	0.5	0	0
O-C=O	1.2	0	0.7
NC=O	4.0	5.6	4.4

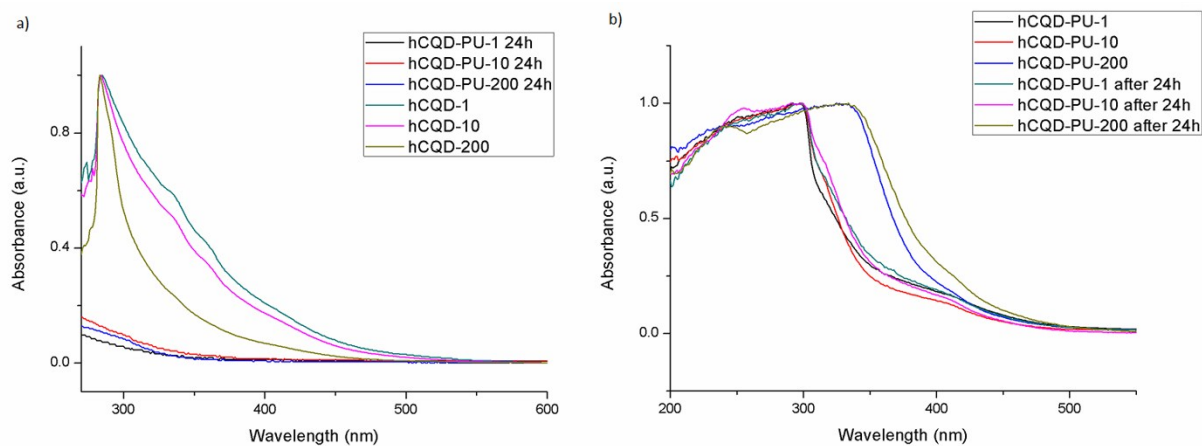


Fig. S1 a) UV-Vis spectra of gamma-irradiated hCQDs dissolved in toluene and aliquots of water in which hCQD-PU-1, hCQD-PU-10 and hCQD-PU-200 nanocomposites were dipped for 24 h; b) Absorbance spectra of hCQD-PU-1, hCQD-PU-10 and hCQD-PU-200 before and after immersion in water for 24h.

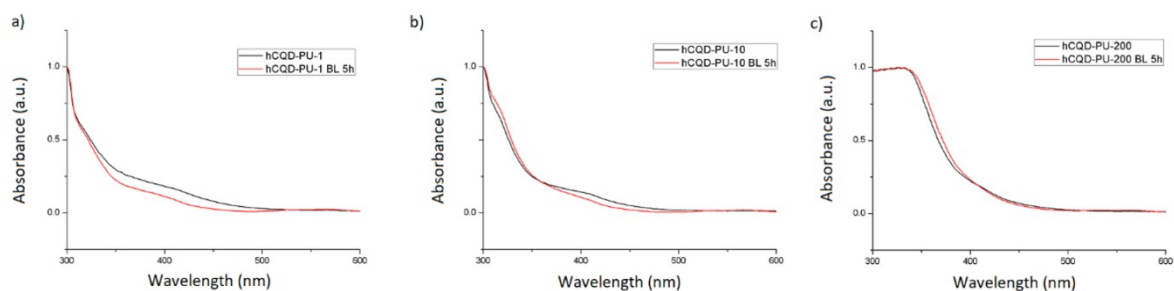


Fig. S2 Stability of a) hCQD-PU-1, b) hCQD-PU-10 and c) hCQD-PU-200 nanocomposites after 5h of exposure to the blue lamp.

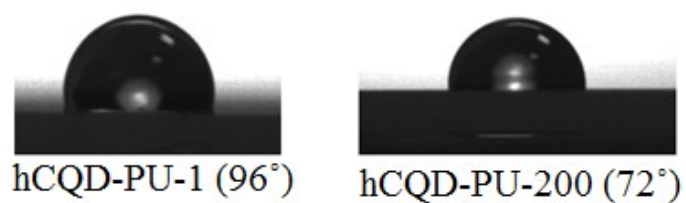


Fig. S3 Optical image of water contact angle measurement on the surface of hCQD-PU-1 and hCQD-PU-200 nanocomposites.

Table S2. Contact angle and surface roughness of the gamma-irradiated hCQD-PU samples

Sample	Rms roughness (nm)	Contact angle (°)
hCQD-PU-1	20.9 ± 1.5	96.5 ± 3
hCQD-PU-10	35.8 ± 1	84.1 ± 1.1
hCQD-PU-200	61.7 ± 1.8	72.6 ± 1.1

Table S3. Values of T_g temperatures for all the samples.

Sample	PU	hCQD-PU-1	hCQD-PU-10	hCQD-PU-200
T_g (°C)	-21.52	-22.59	-22.04	-22.85

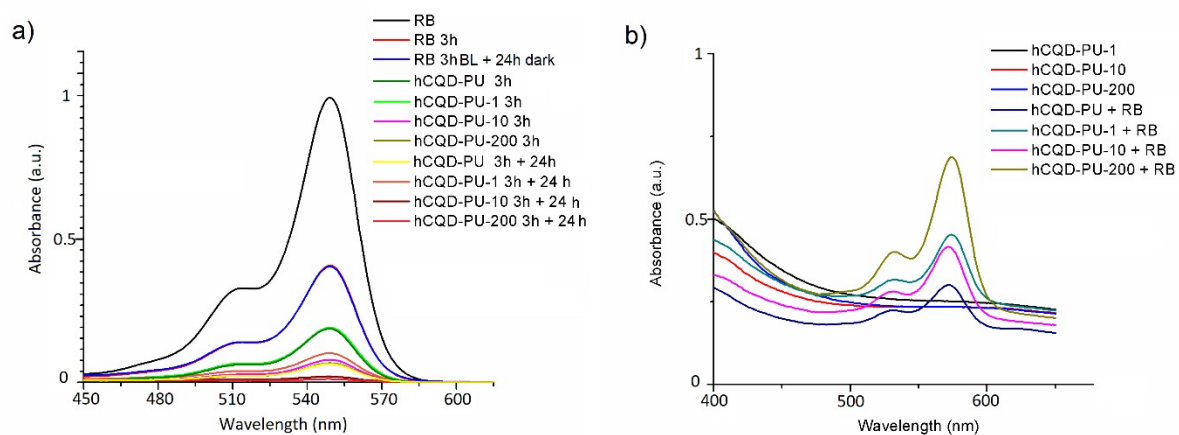


Fig. S4 a) The RB removal efficiency of hCQD-PU samples after 3h of exposure to BL, and after 3 h of BL + 24 h in dark, measured from the aliquots of a water solution of RB; **b)** Absorbance spectra of gamma irradiated polymer samples before and after they were immersed in RB solution for 24 h;