Supporting Information

Long-chain surface-modified red-emitting carbon dots as fluorescent additives for 3D printing vat-photopolymerization

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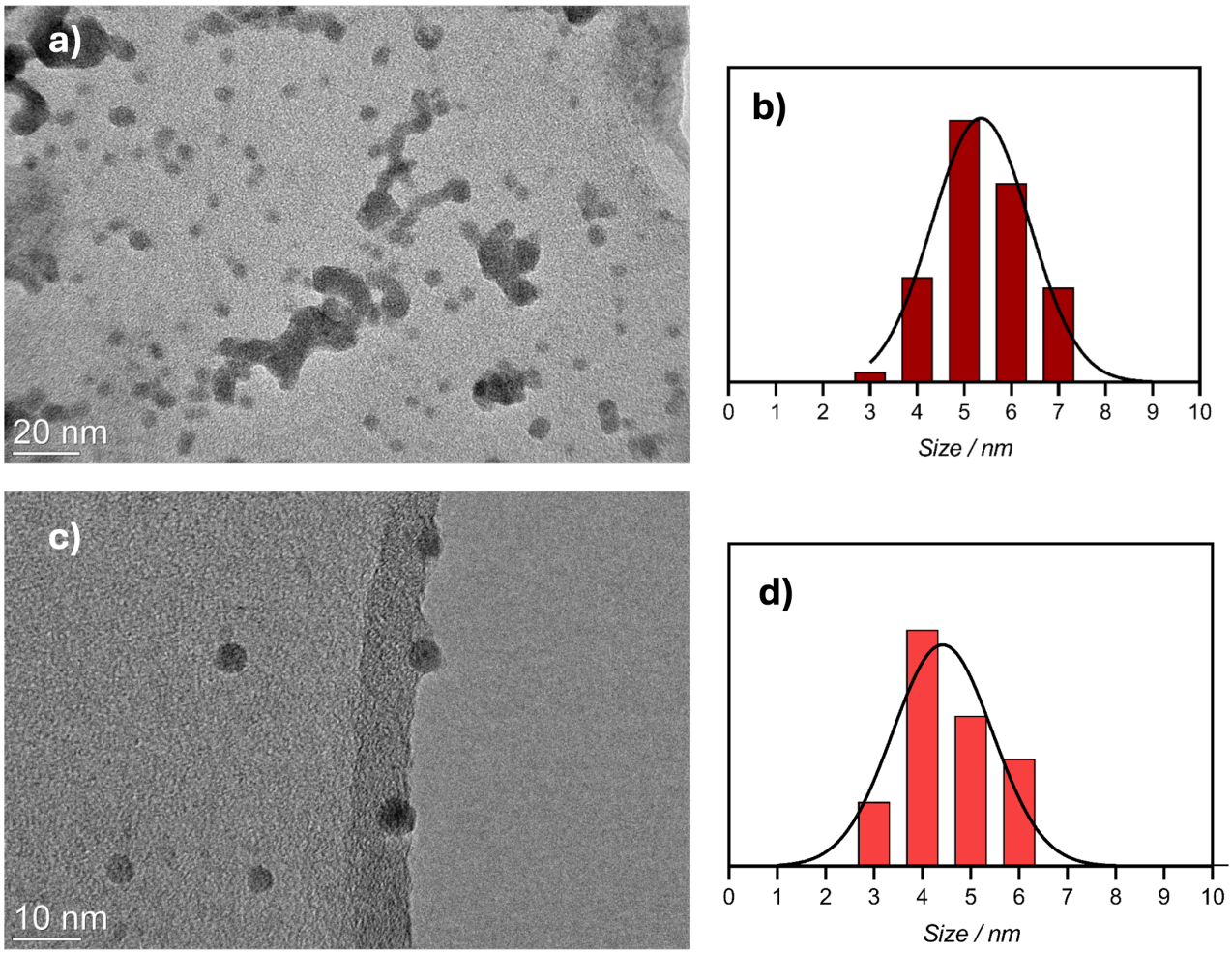

Fig. S1: A TEM image (a) of L-RCDs and their size distribution (b) showing an average diameter of 5.35 nm (SD=1.03); a TEM image of RCDs (c) and their size distribution (d) showing an average diameter of 4.42 nm (SD=1.03).

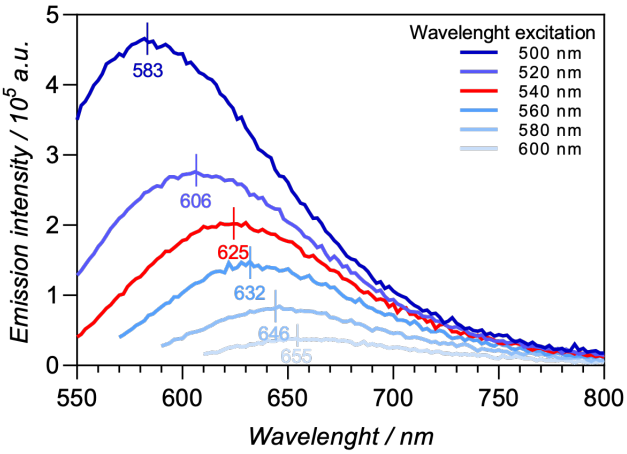

Fig. S2: Screening of the emission of **RCDs** in H_2O solution exciting in the range 500-600 nm.

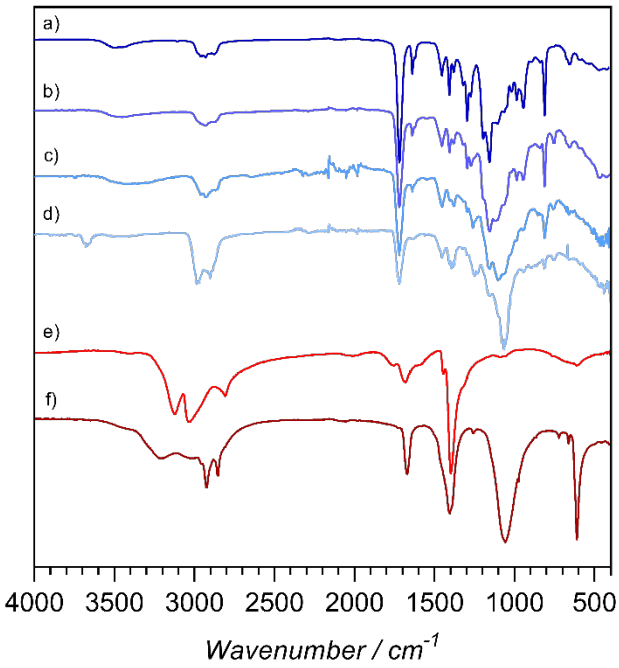

Fig. S3: ATR-FTIR spectra of the photocurable **Resin-R** before (a), after (b) the 3D printing process, printed **Resin-R** with the addition of 0.1% w/w of RCDs (c) and printed **Resin-R** with the addition of 0.1% w/w of L-RCDs (d). FT-IR spectra of the water solutions of RCDs (e) and L-RCDs (f) were added for comparison.

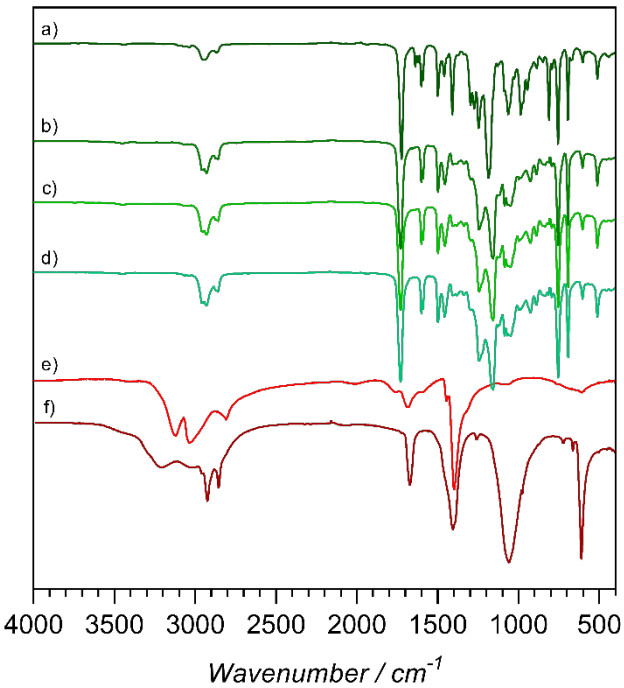

Fig. S4: ATR-FTIR spectra of the photocurable **Resin-F** before (a), after (b) the 3D printing process, printed **Resin-F** with the addition of 0.1% w/w of RCDs (c) and printed **Resin-F** with the addition of 0.1% w/w of L-RCDs (d). FT-IR spectra of the water solutions of RCDs (e) and L-RCDs (f) were added for comparison.

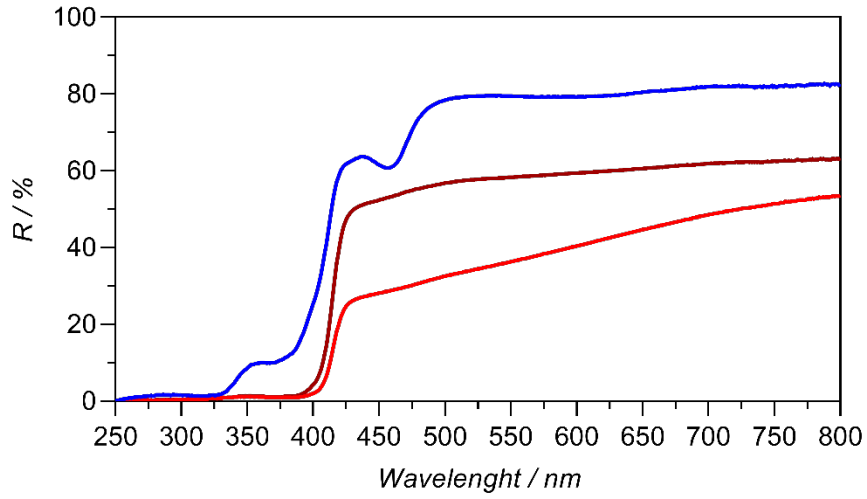

Fig. S5: Reflectance spectra of the pristine **Resin-R** (blue), **Resin-R**@L-RCDs-0.1% w/w (brown) and **Resin-R**@RCDs-0.1 % w/w (red).

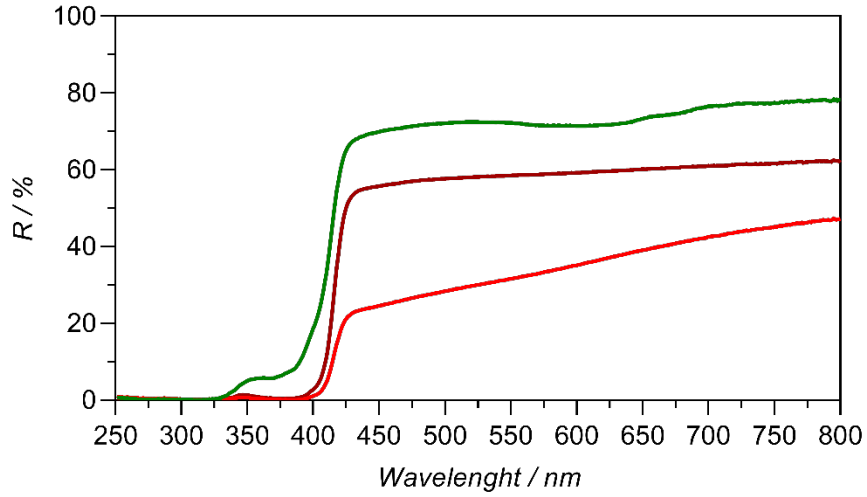

Fig. S6: Reflectance spectra of the pristine **Resin-F** (green), **Resin-F**@L-RCDs-0.1% w/w (brown) and **Resin-F**@RCDs-0.1 % w/w (red).

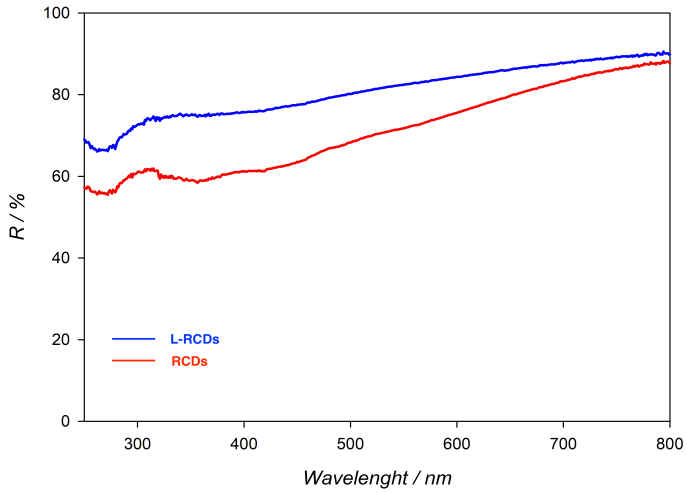

Fig. S7: Reflectance spectra of **L-RCDs** (blu) and **RCDs** (red).

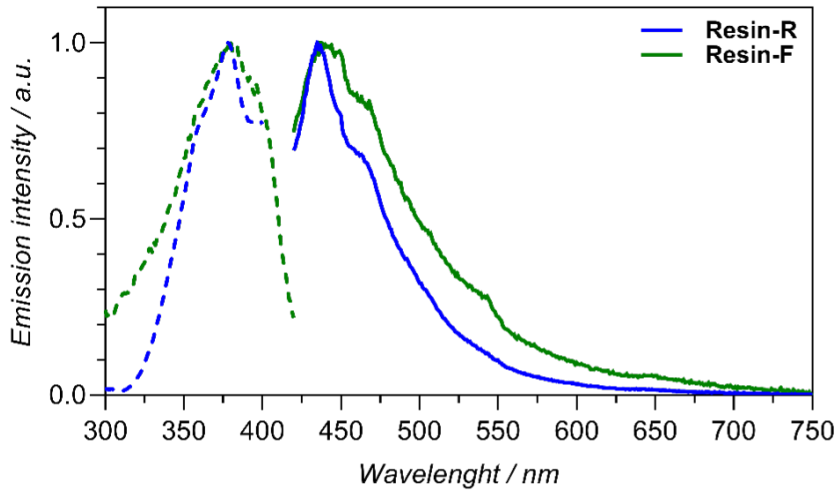

Fig. S8: Normalized excitation (dashed) and emission (solid) spectra of pristine printed **Resin-R** (blue) and **Resin-F** (green).

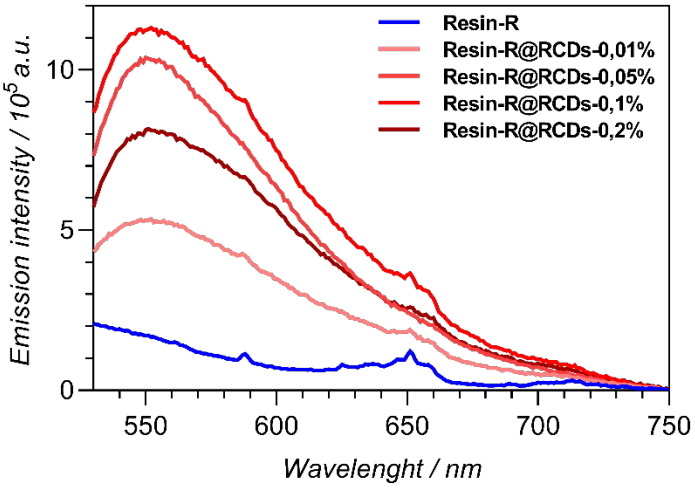

Fig. S9: Screening of the emission of **Resin-R**@RCDs in 0.01, 0.05, 0.1 and 0.2 % w/w (λ_{exc}=500 nm).

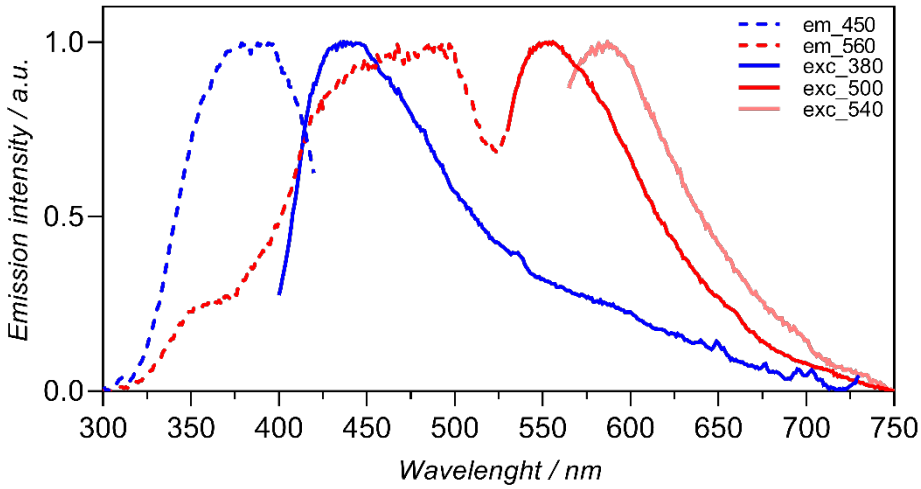

Fig. S10: Normalized excitation (dashed) and emission (solid) spectra of **Resin-R**@RCDs-0.1% w/w at different wavelengths.

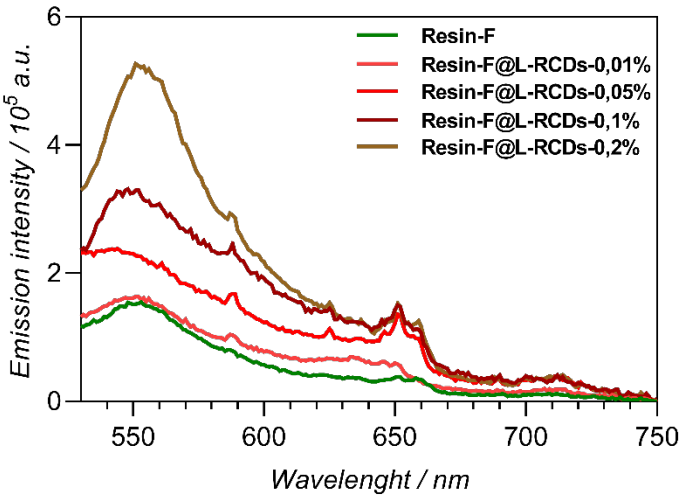

Fig. S11: Screening of the emission of **Resin-F**@L-RCDs in 0.01, 0.05, 0.1 and 0.2 % w/w (λ_{exc}=500 nm).

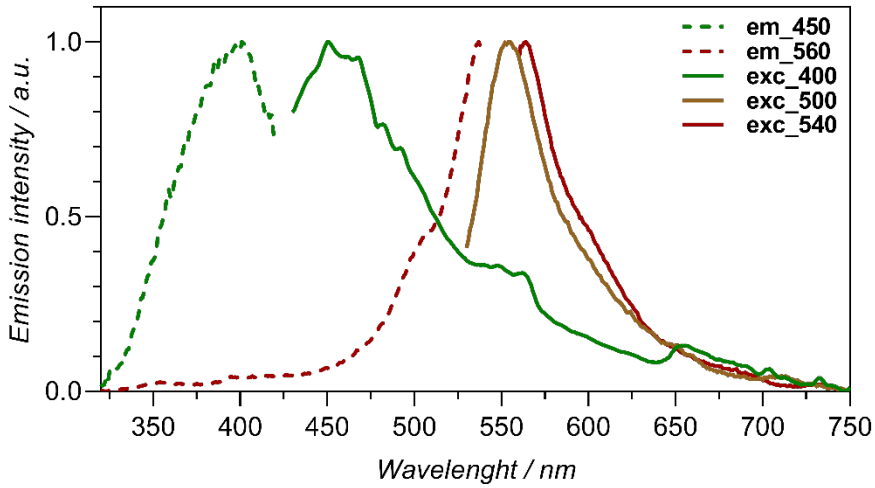

Fig. S12: Normalized excitation (dashed) and emission (solid) spectra of **Resin-F**@L-RCDs-0.2% at different wavelengths.

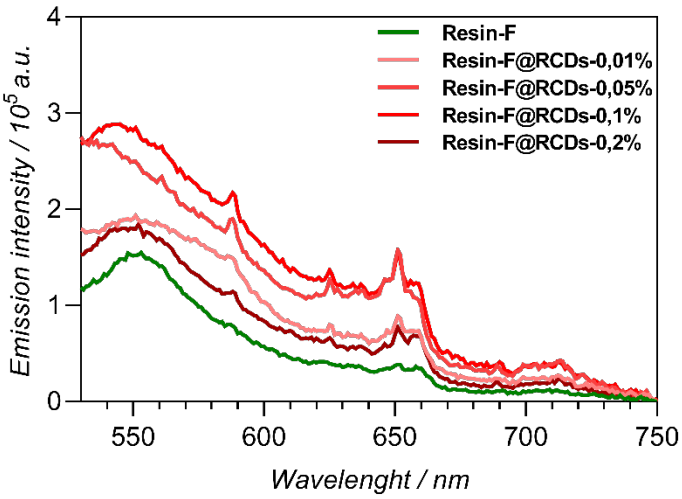

Fig. S13: Screening of the emission of **Resin-F**@RCDs in 0.01, 0.05, 0.1 and 0.2 % w/w (λ_{exc}=500 nm).

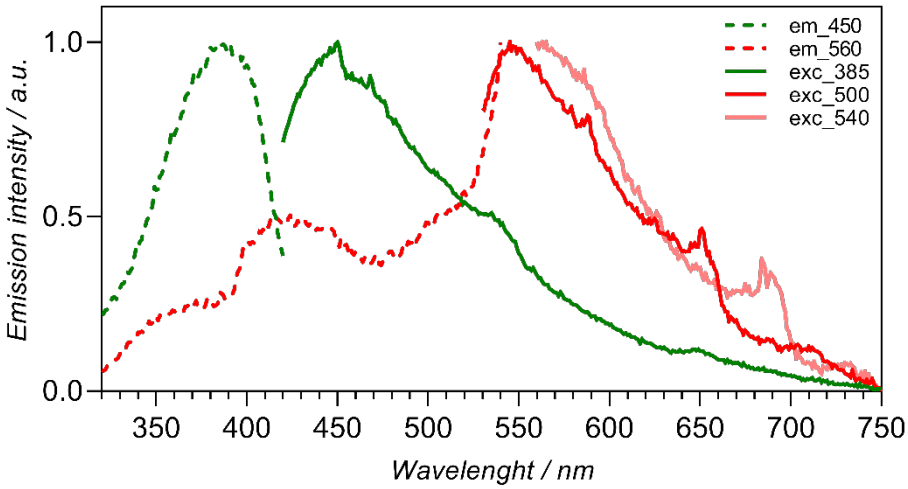

Fig. S14: Normalized excitation (dashed) and emission (solid) spectra of **Resin-F**@RCDs-0.1% w/w at different wavelengths.

Resin_R									
	0%	0,01% RCDs	0,05% RCDs	0,1% RCDs	0,2% RCDs	0,01% L-RCDs	0,05% L-RCDs	0,1% L-RCDs	0,2% L-RCDs
Young's Modulus / MPa	1027±32	822±95	988±47	894±41	895±38	818±30	850±74	1092±65	954±56
Elongation at break / %	4.2±0,7	4±1	2,3±0,9	2,2±0,5	3±1	3±1	2,5±0,6	2,2±0,2	3,9±0,4
Tensile strenght / MPa	31±3	30±5	19±2	17±3	24±7	27±8	19±4	22±1	31±4

Resin_F									
	0%	0,01% RCDs	0,05% RCDs	0,1% RCDs	0,2% RCDs	0,01% L-RCDs	0,05% L-RCDs	0,1% L-RCDs	0,2% L-RCDs
Young's Modulus /MPa	12,4±0,7	12,8±0,2	10±1	11.5±0,3	13,0±0,3	12,3±0,5	13±1	11,0±0,1	12±1
Elongation at break / %	17,1±0,8	16,3±0,6	12±2	14,2±0,8	16±1	19±1	18±1	17±1	16,5±0,8
Tensile strenght / MPa	2,0±0,1	2,0±0,1	1,4±0,3	1,5±0,1	2,0±0,2	2,3±0,3	2,3±0,2	1,9±0,2	2,0±0,1

Fig. S15: Tensile tests results of the printed objects.

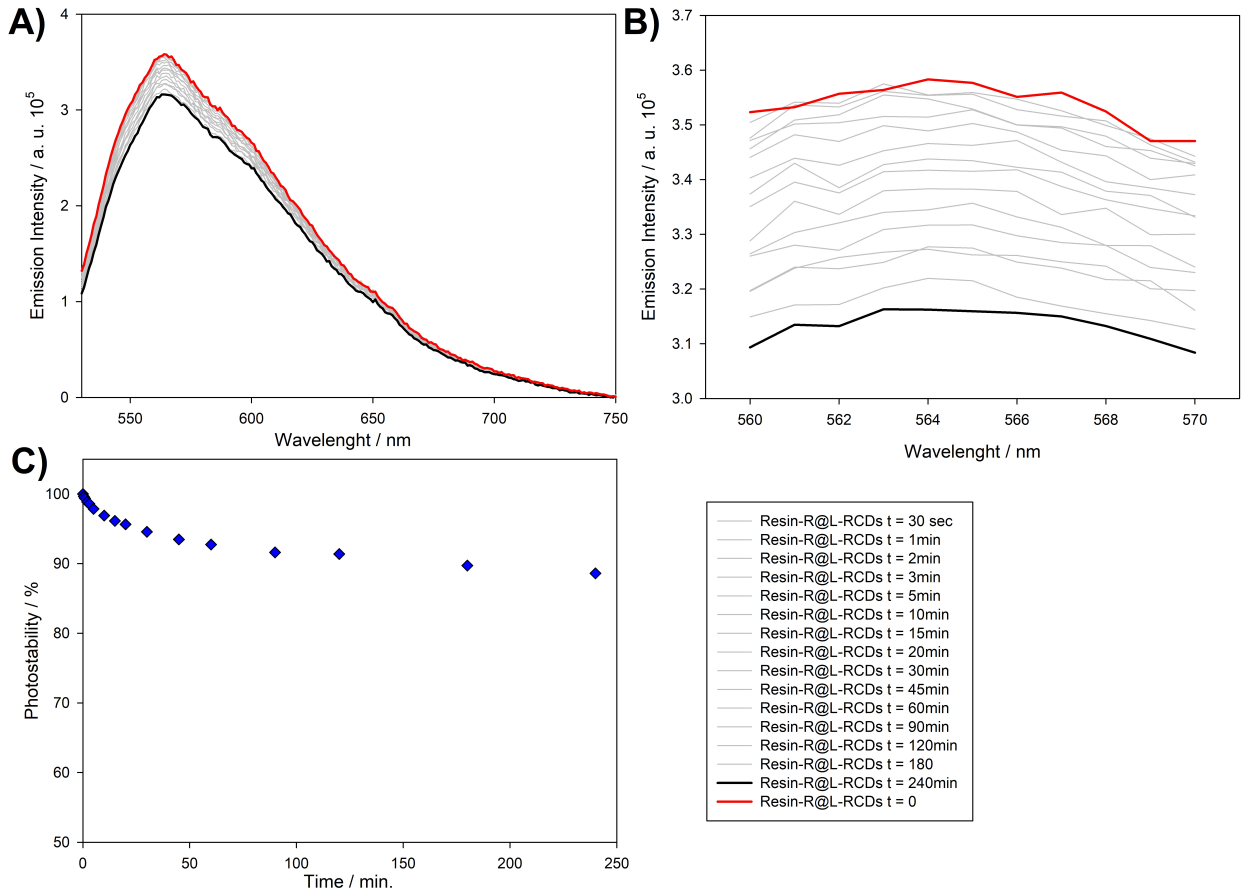

Fig. S16: Photostability test of **Resin-R** containing 0.2% of L-RCDs irradiated at 405 nm with a curing oven (LED power = 9.1 W).