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Electronic Supplementary Information (ESI)

Electron transfer photochromism of solid-state supramolecules constructed by cucurbit[n]uril (n = 5-8) and 1-(4-carboxybenzyl)-4-[2-(4-pyridyl)-vinyl]-pyridinium chloride

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Figure S1. 2D gCOSY NMR spectrum of 1^+ with 1.10 equiv. of Q[5] at pD 2.0.



Figure S2. 2D gCOSY NMR spectrum of 1^+ with 1.10 equiv. of Q[6] at pD 2.0.



Figure S3. 2D gCOSY NMR spectrum of 1^+ with 1.12 equiv. of Q[8] at pD 2.0.



Figure S4. ¹H NMR spectra of 1^+ (A) with 1.12 equiv of Q[8] before (B) and after (C) irradiation.

Figure S5. UV-Vis spectra of $1^+_2@Q[8]$ before and after irradiation.





Figure S6. Left column, change in absorption spectra of guest **1** with increasing concentration of Q[n]. Right column, the curves of Absorbance *vs.* $N_{Q[n]}/N_{guest}$.

Table	S1 .	Binding	ratios	and bir	nding	constants	of 1^+	+·Cl ⁻ w	ith C	n	S
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able S1. Binding ratios	and binding co	nstants of $1^+ \cdot Cl^-$	with Q[<i>n</i>]s.	
	0[7]	01(1	0[7]	0[0]
Host	Q[5]	Q[6]	Q[7]	Q[8]
Host Binding ratios	Q[5] 1:1	Q[6]	Q[7] 1:1	Q[8] 1:2
Host Binding ratios	Q[5] 1:1	Q[6] 1:1	Q[7] 1:1	Q[8] 1:2



Figure S7. Photos showing the colour change can occur multiple times.

Figure S8. IR spectra of $1^+@Q[7]$ before and after irradiation.



Figure S9. IR spectra of inclusion complex $1^+_2@Q[8]$ before and after irradiation.





Figure 10. Energy minimized structures of four complexes $1^+ \cap Q[5]$, $1^+ @Q[6]$, $1^+ @Q[7]$, and $1^+ @Q[8]$ in the gas phase by a HF/3-21G** calculation.