

Supporting Information

Advanced Functional Materials

Effect of the Molecular Size of Analytes on Polydiacetylene Chromism

By Donghwan Seo and Jinsang Kim

× Every acid addition test was done by adding acid (2 ml) to polymerized liposome solution (2 ml). The spectral intensity of ‘photopolymerized’ (blue phase) shown in all figures are simply ½ of that of original ones for a better comparison with the spectra after addition of acid analytes.

1. Absorption transition with respect to time duration after addition of acid analytes

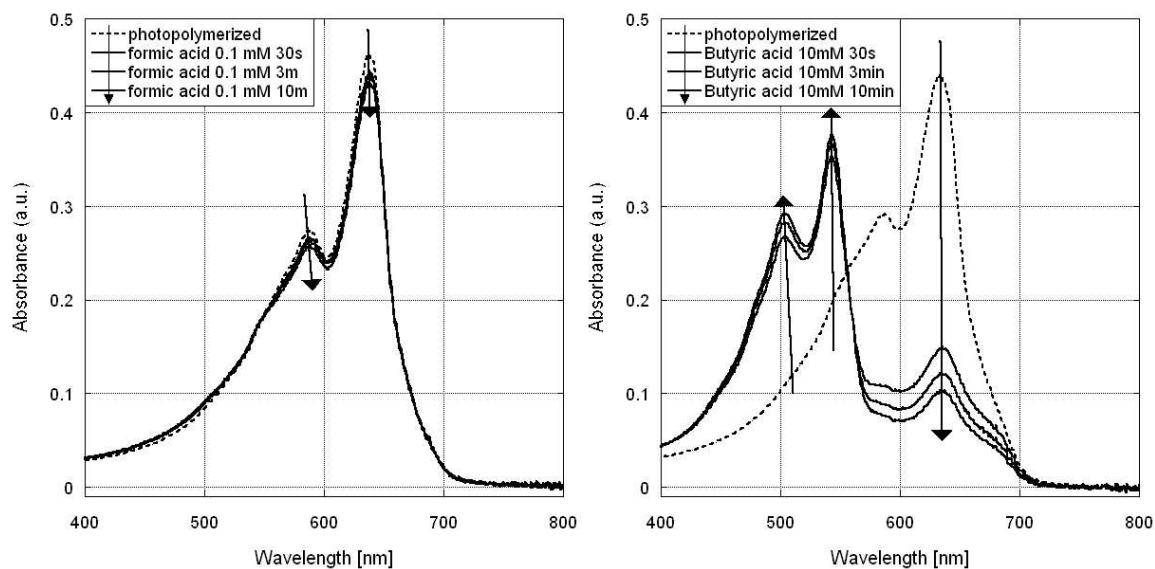


Figure S1. Absorption spectra of APCDA2 at 30 s, 1 min and 10 min after acid addition (left: formic acid, right: butyric acid).

2. Absorption transition with respect to concentration of alkanolic acids

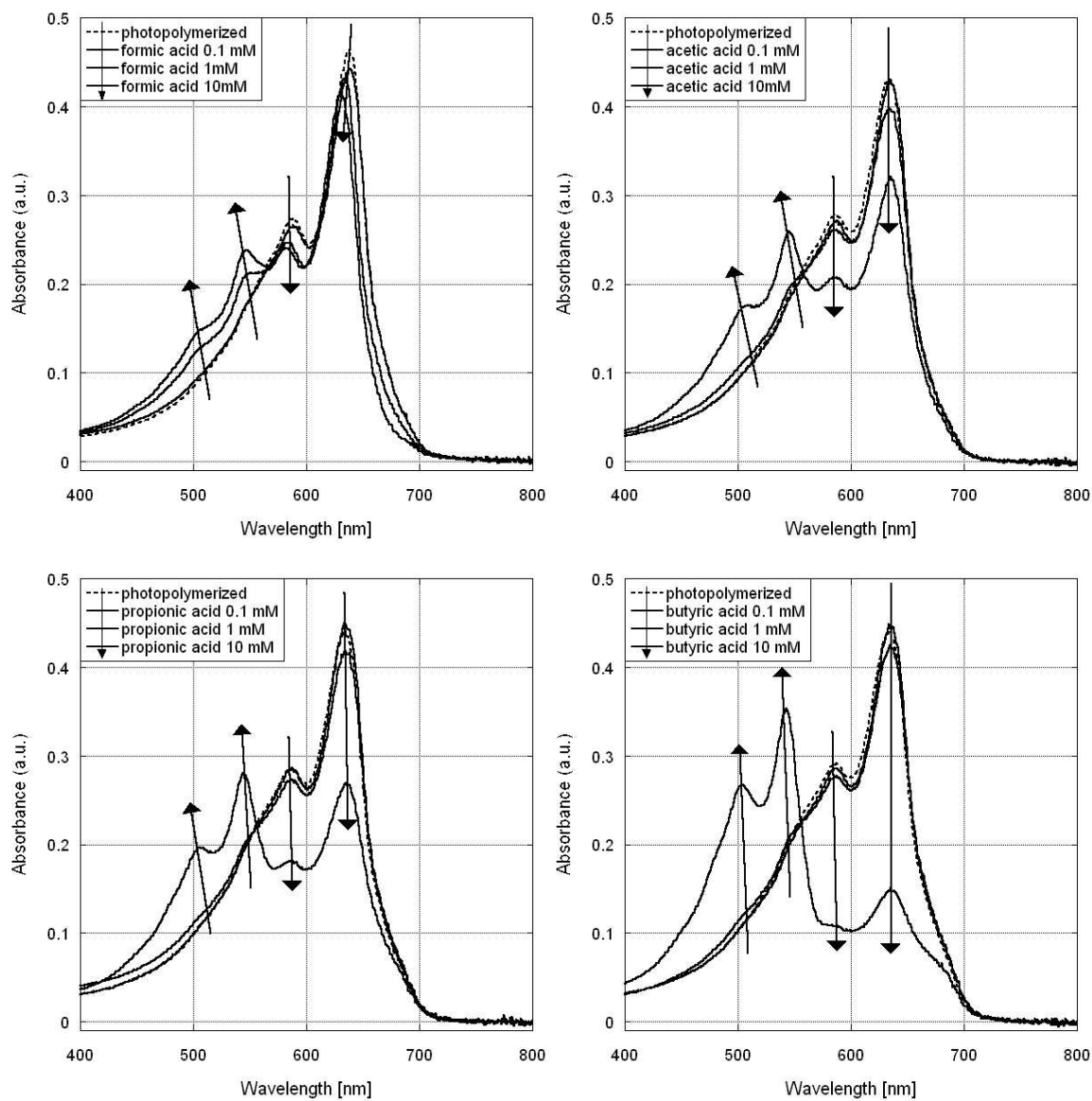
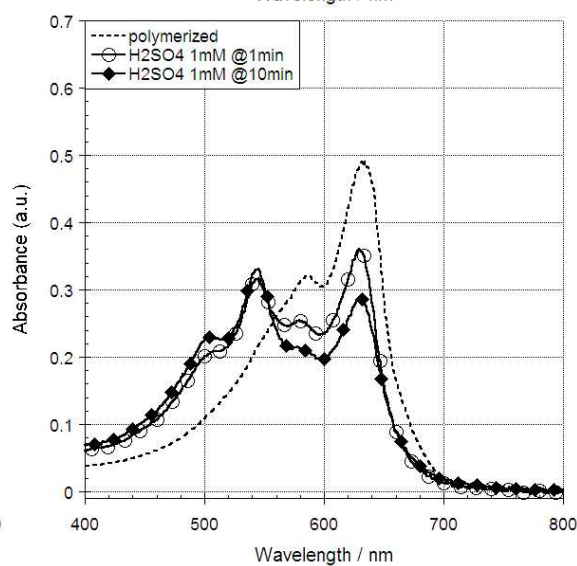
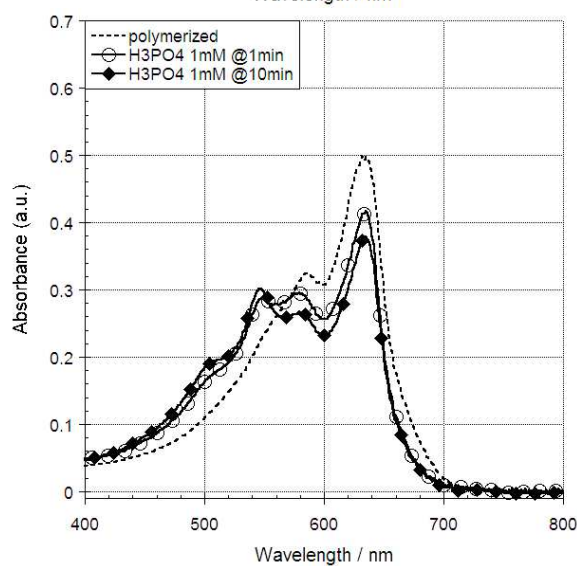
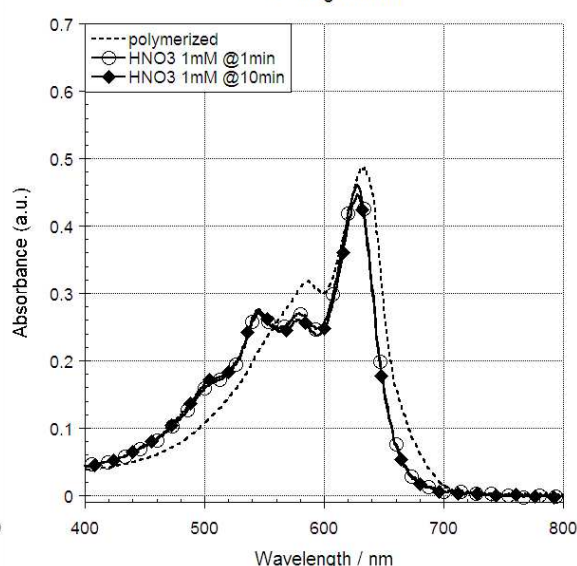
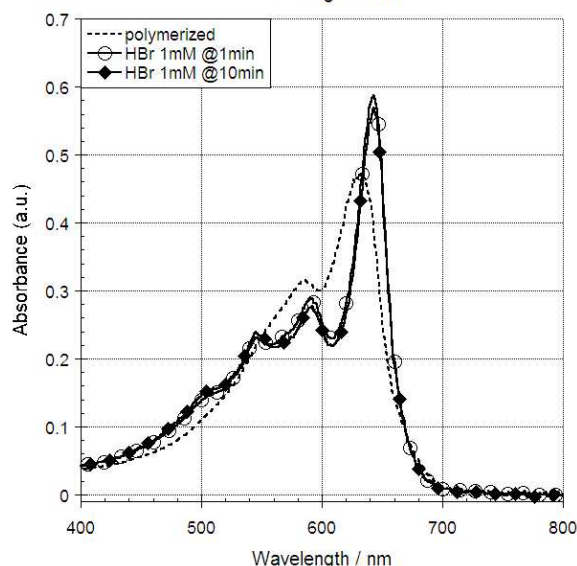
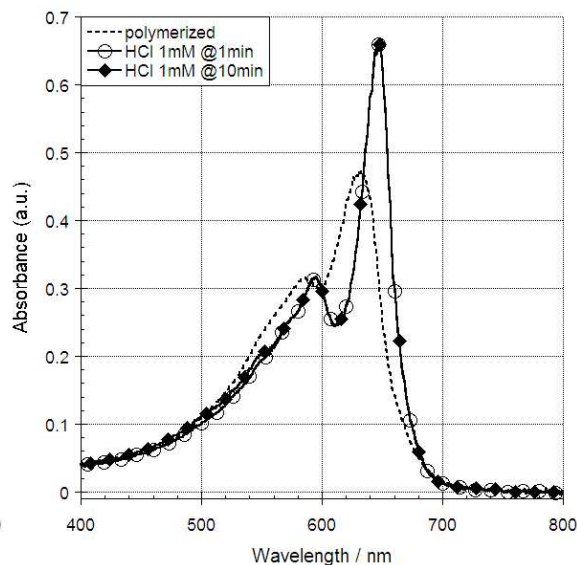
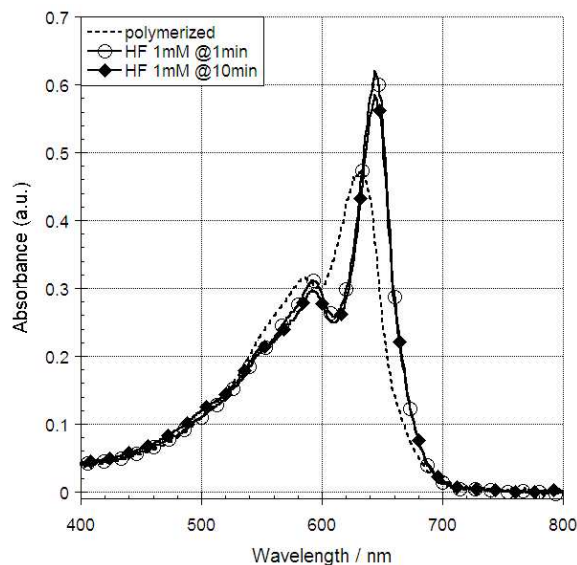


Figure S2. Absorption spectra of APCDA2 (0.05 mM) on addition of alkanolic acids (0.1, 1 and 10 mM) at 30 s (top left: formic acid, top right: acetic acid, bottom left: propionic acid and bottom right: butyric acid).

3. Absorption transition with respect to time duration after addition of general acids and DEP



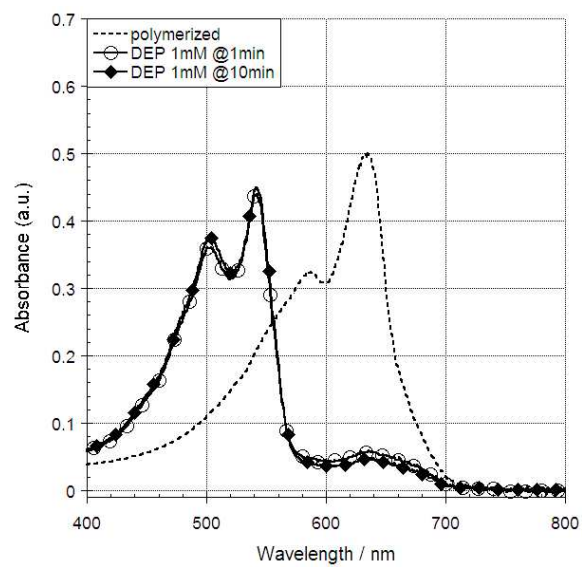


Figure S3. Absorption spectra of APCDA2 (0.05 mM) on addition of acids (1 mM) at 1 and 10 min.

4. Photopolymerization of APCDAn (n = 2 ~ 6)

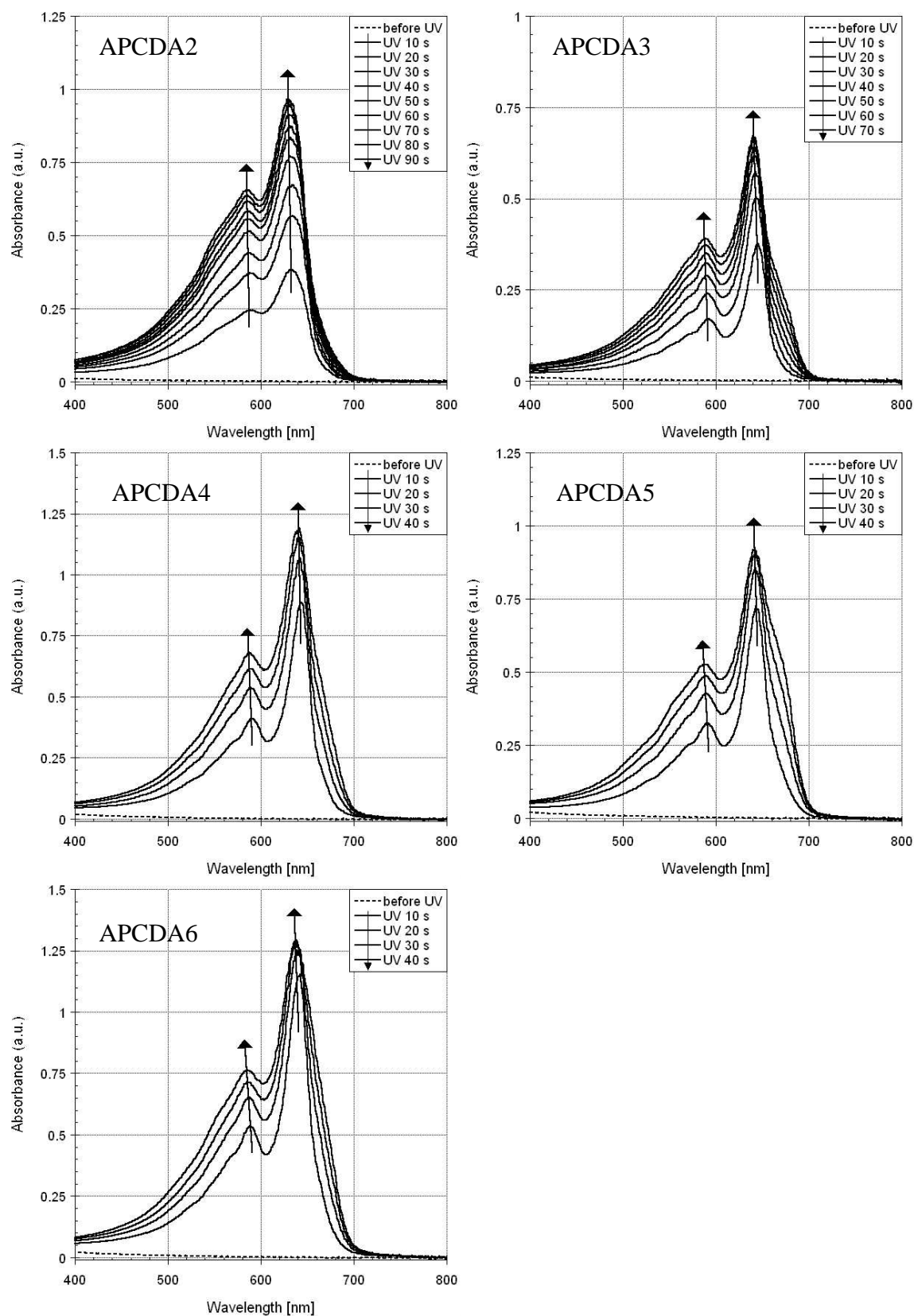
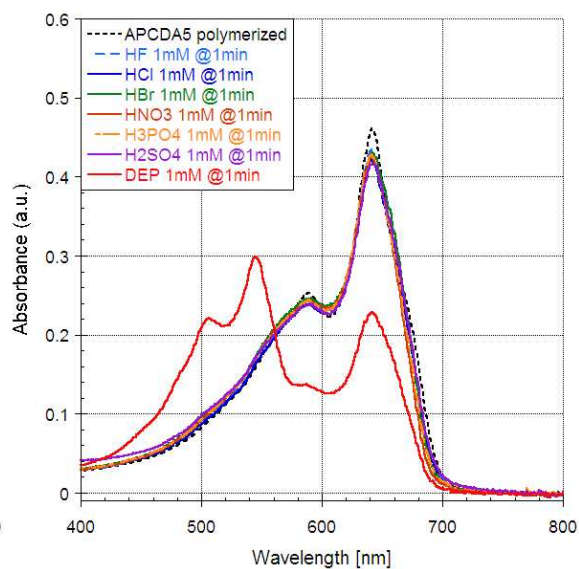
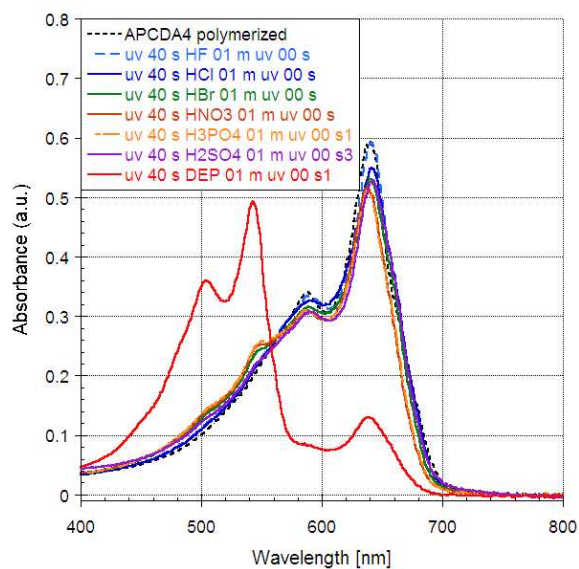
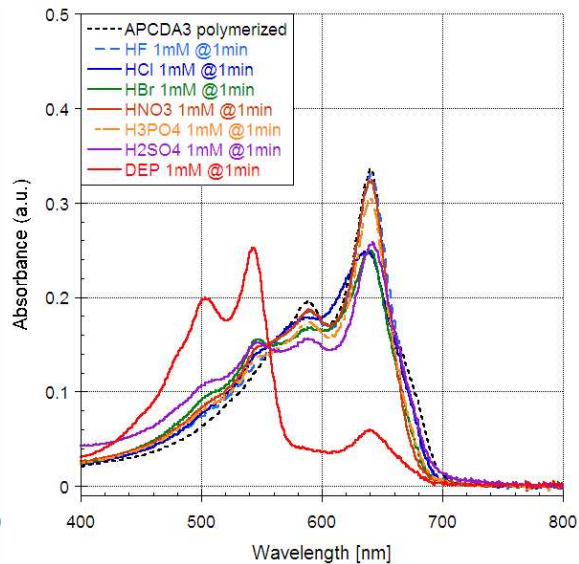
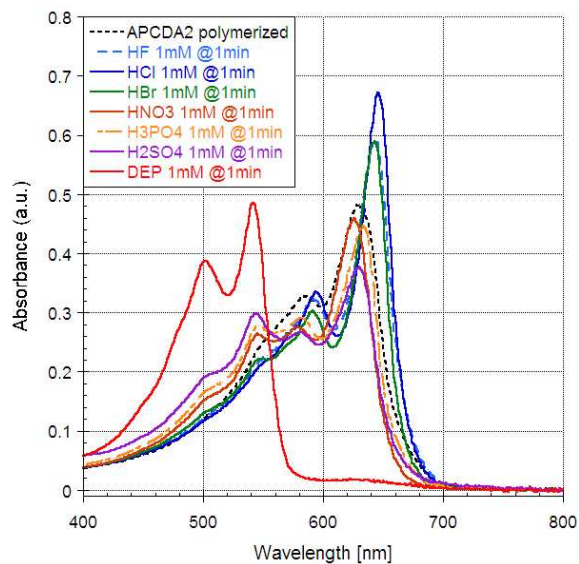


Figure S4. Photopolymerization of APCDAn liposome solution (0.1 mM): APCDA2 and APCDA3 (top), APCDA4 and APCDA5 (middle), and APCDA6 (bottom).

5. Absorption transition with respect to alkyl spacer length after addition of general acids and DEP



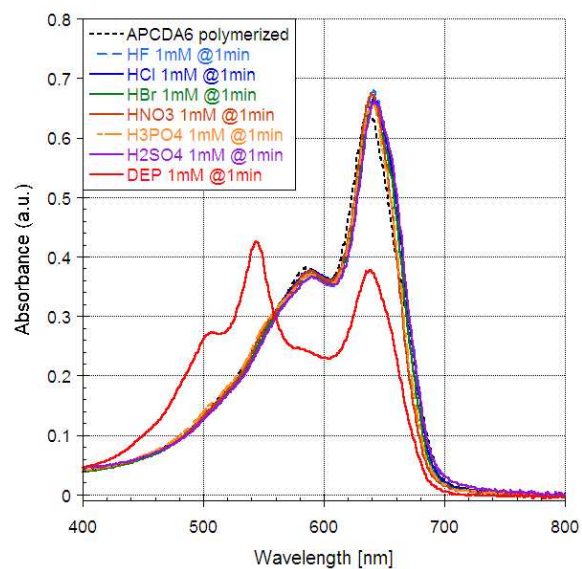
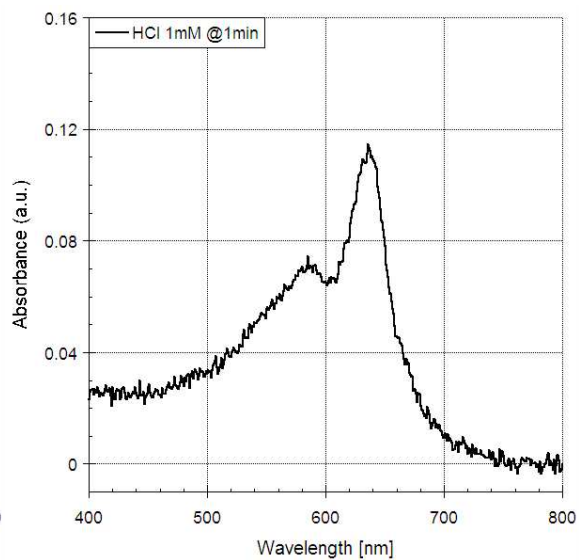
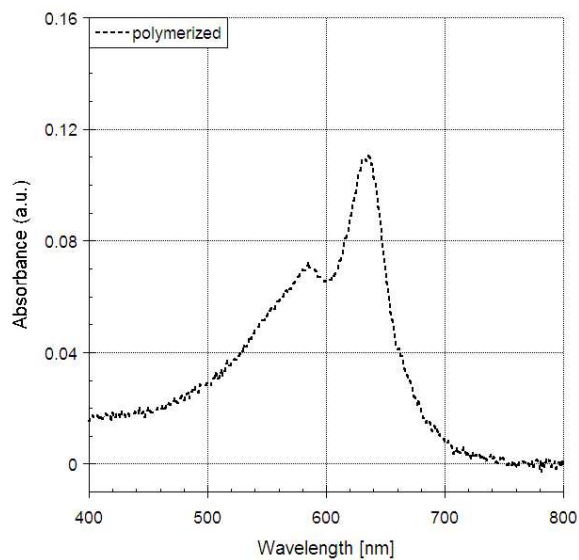
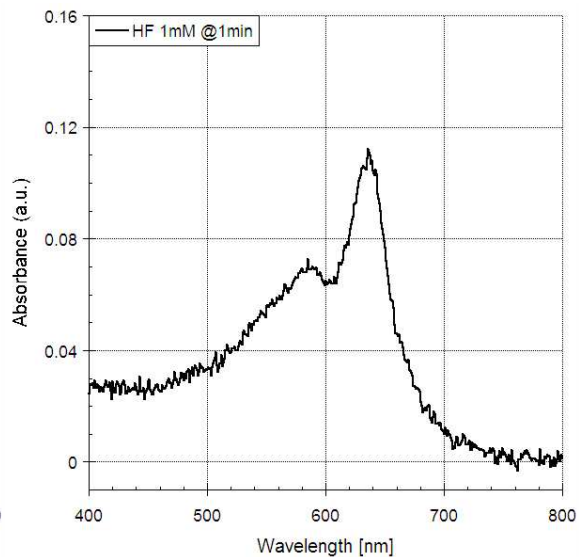
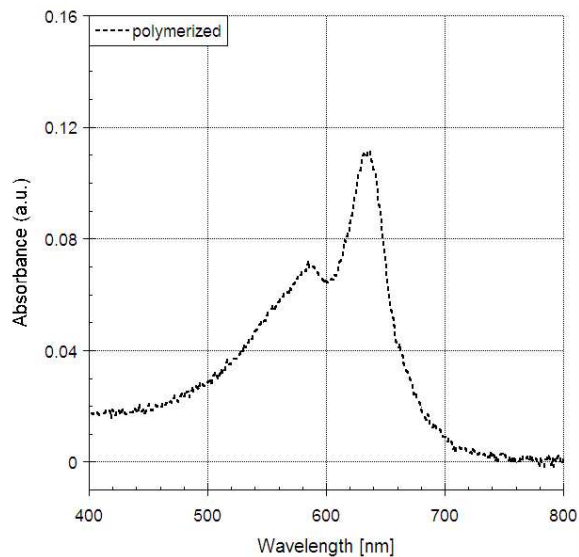
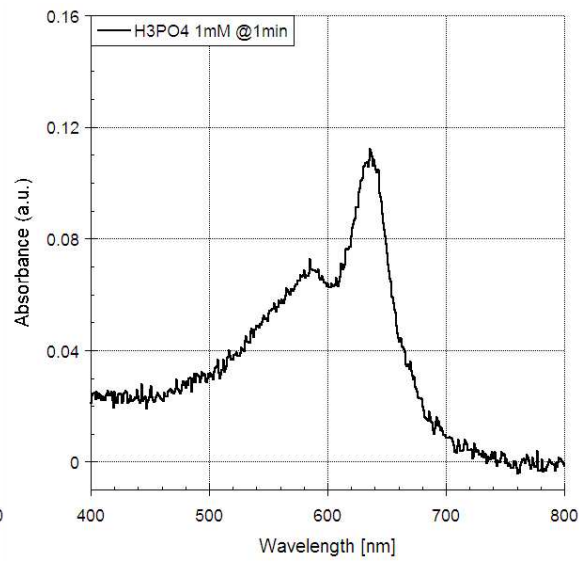
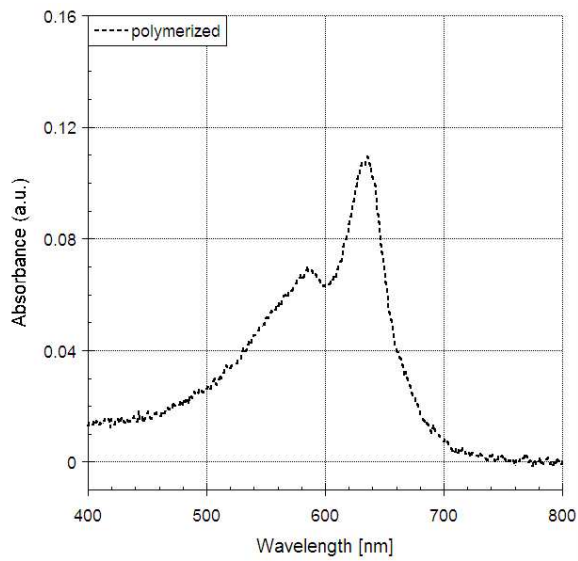
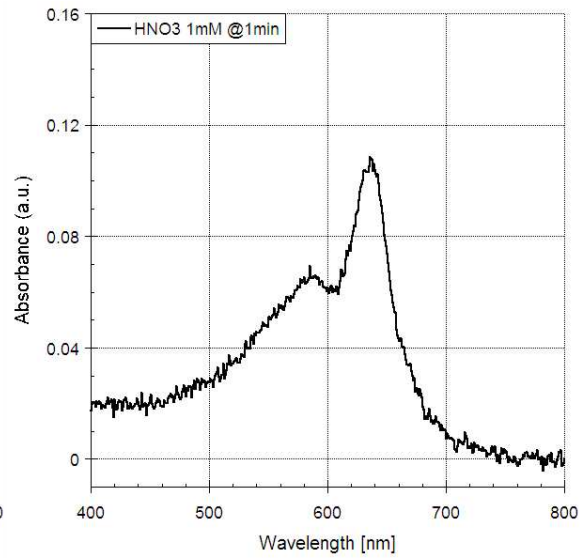
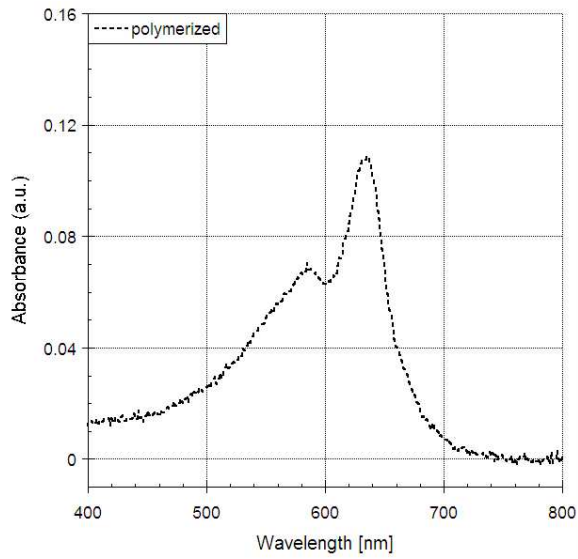
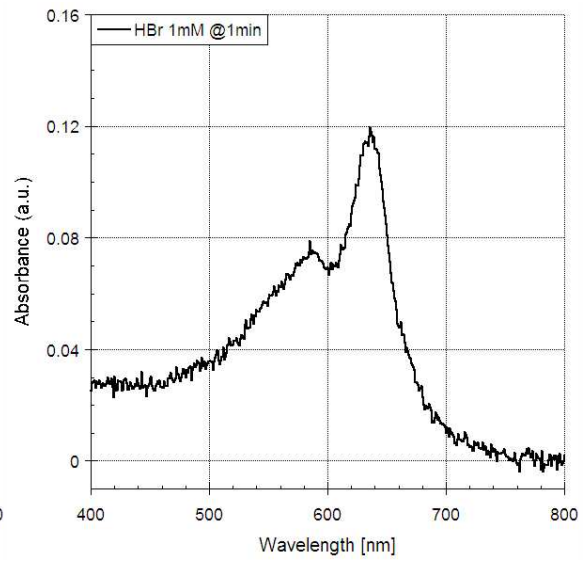
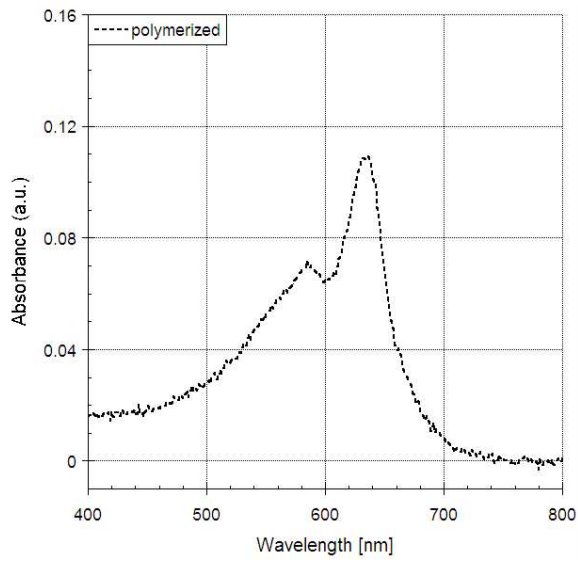


Figure S5. Absorption spectra of APCDA6 (0.05 mM) on addition of acids (1 mM) at 1 min.

6. Control study: Absorption transition of HPCDA2 after addition of general acids and DEP





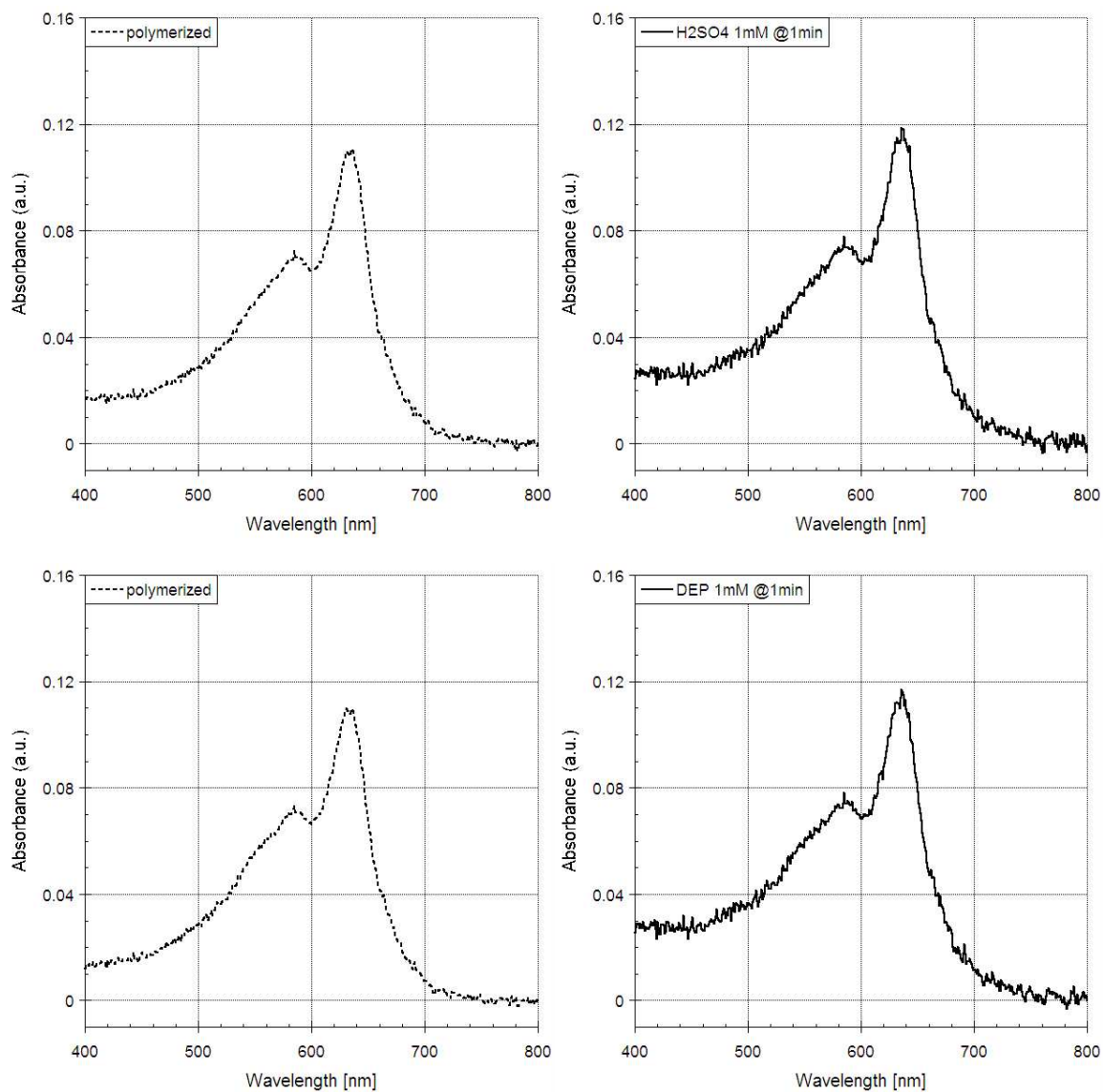


Figure S6. Absorption spectra of HPCDA2 (0.05 mM) on addition of acids (1 mM) at 1 min (left: before addition, right: after addition of individual acid).

Table S1. Chemical properties of acid analytes

Formula	Acid Name	M.W.	pH (10^{-3} M)
HF	Hydrofluoric acid	20.01	3.37 ± 0.04
HCl	Hydrochloric acid	36.46	3.05 ± 0.28
HBr	Hydrobromic acid	80.91	3.00 ± 0.30
HNO ₃	Nitric acid	63.01	3.01 ± 0.30
H ₃ PO ₄	Phosphoric acid	98.00	2.91 ± 0.24
H ₂ SO ₄	Sulfuric acid	98.08	2.75 ± 0.28
(C ₂ H ₅ O) ₂ P(O)OH	Diethyl phosphate (DEP)	154.10	3.17 ± 0.32