Incorporation of Anionic Monomer to Tune the Reversible Catechol-Boronate Complex for pH-Responsive, Reversible Adhesion

AUTHOR INFORMATION

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Scheme S1. Chemical structures of *N*-hydroxyethyl acrylamide (HEAA), dopamine methacrylamide (DMA), 3-acrylamido phenylboronic acid (APBA), acrylic acid (AAc), methylene bis-acrylamide (MBAA) and 2,2-dimethoxy-2-phenylacetophenone (DMPA).

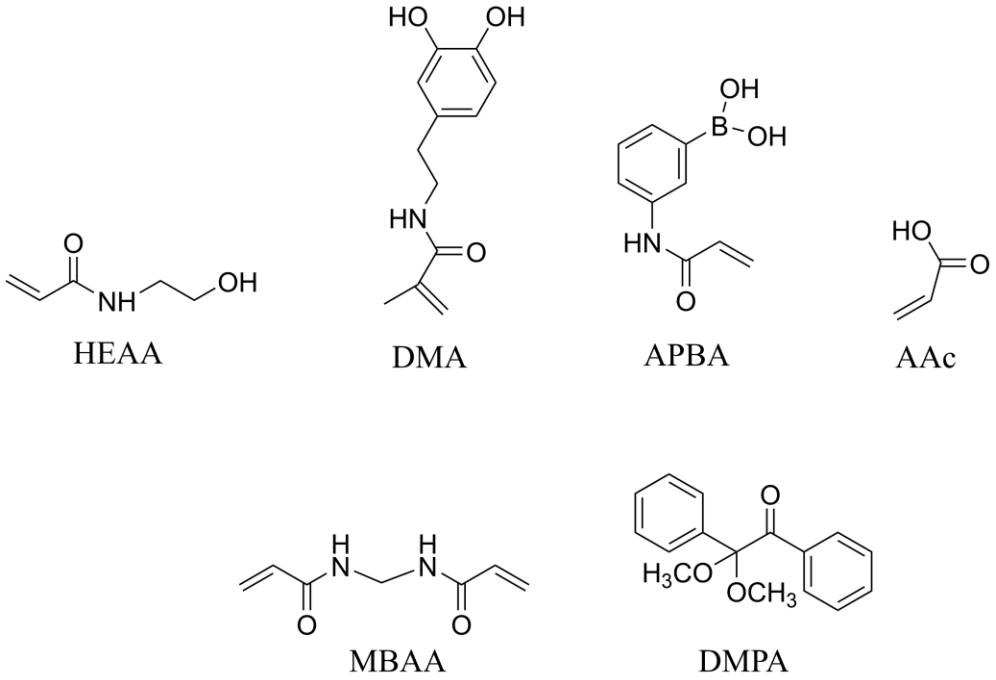

Table S1. Statistical analysis for equilibrium swelling ratio of adhesive equilibrated at pH 3.0, 7.5, 8.5 or 9.0 for 24 h. Compositions not connected by the same letter at a given pH are significantly different.

	pH 3.0	pH 7.5	pH 8.5	pH 9.0
D10B10A0	A	A	A	A
D10B10A10	A B	B	B	B
D10B10A20	A B	C	C	C
D10B10A30	B	B	D	C

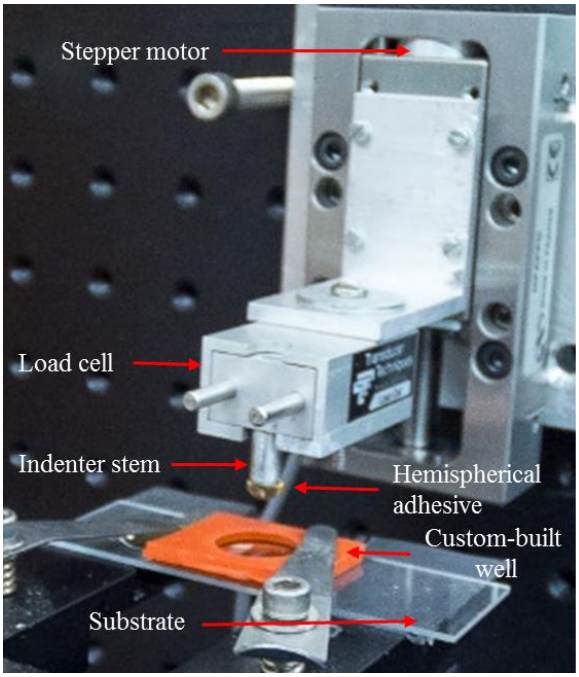

Figure S1. Photograph of the contact mechanics setup used for the adhesion experiments.

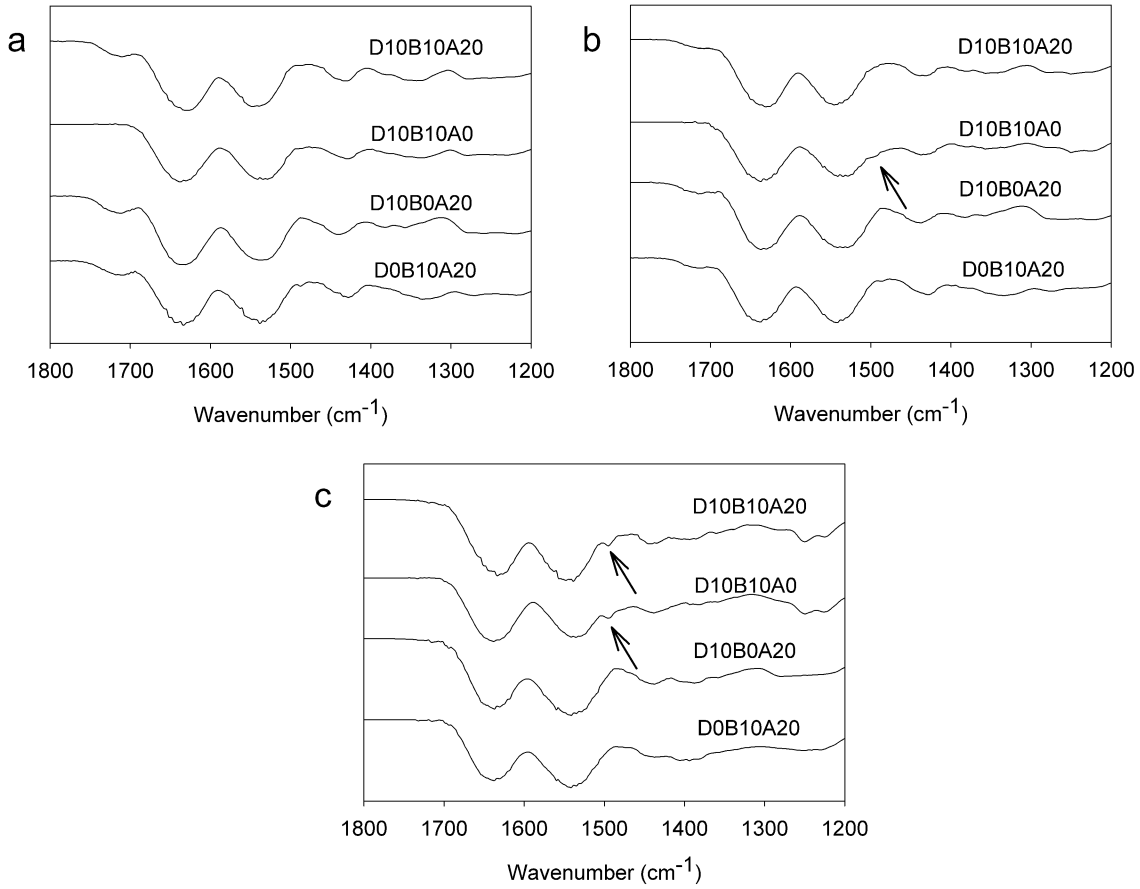

Figure S2. FTIR spectra of adhesives equilibrated at pH 3.0 (a), pH 7.5 (b) or pH 9.0 (c). The arrows indicate peaks corresponding to formation of the catechol-boronate complex at 1490 cm^{-1}.

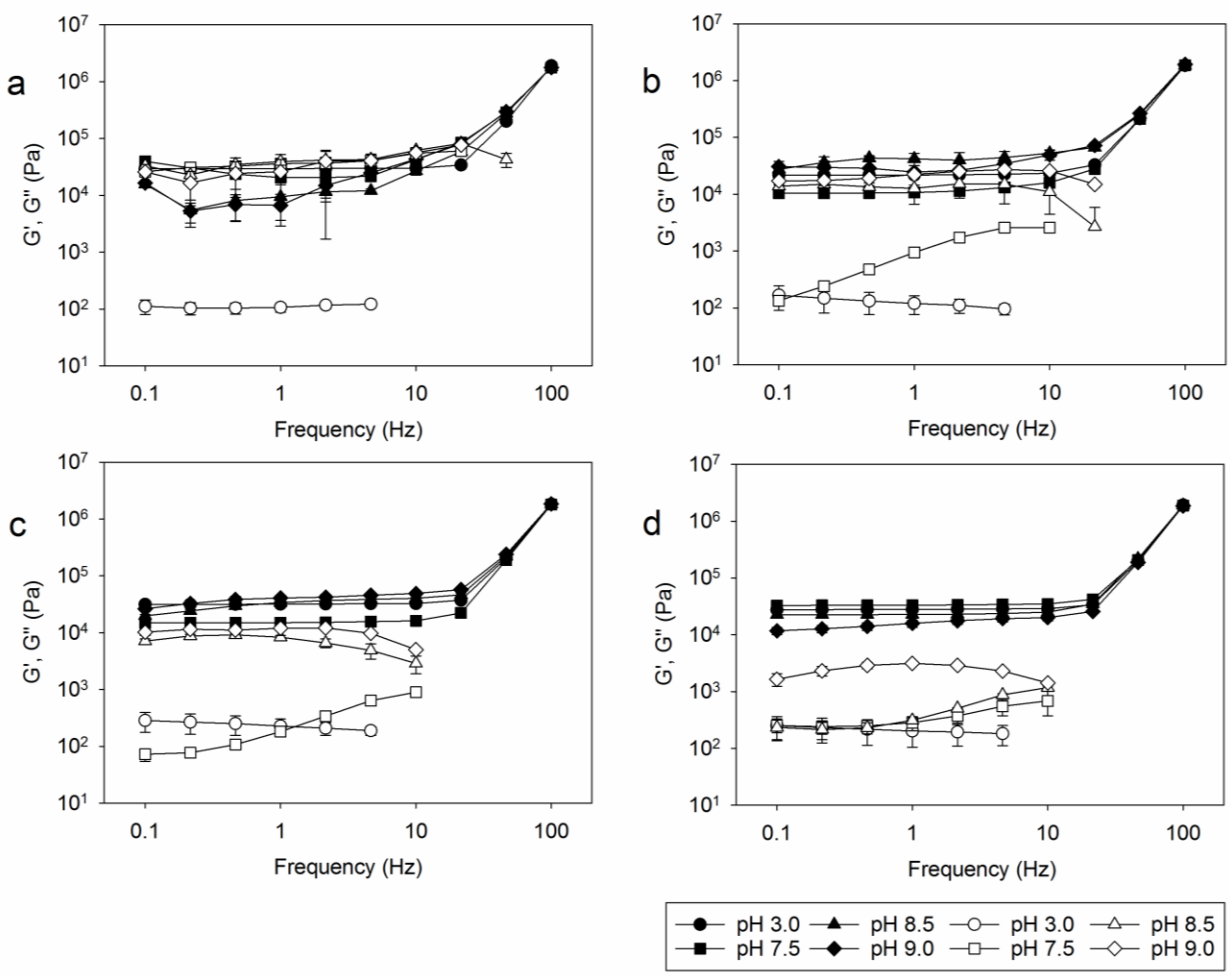

Figure S3. Storage (G′, filled symbols) and loss (G″, empty symbols) moduli for D10B10A0 (a), D10B10A10 (b), D10B10A20 (c) and D10B10A30 (d) equilibrated at pHs 3.0, 7.5, 8.5 or 9.0 and tested in the frequency range of 0.1-100 Hz and 8 % strain (n = 3).

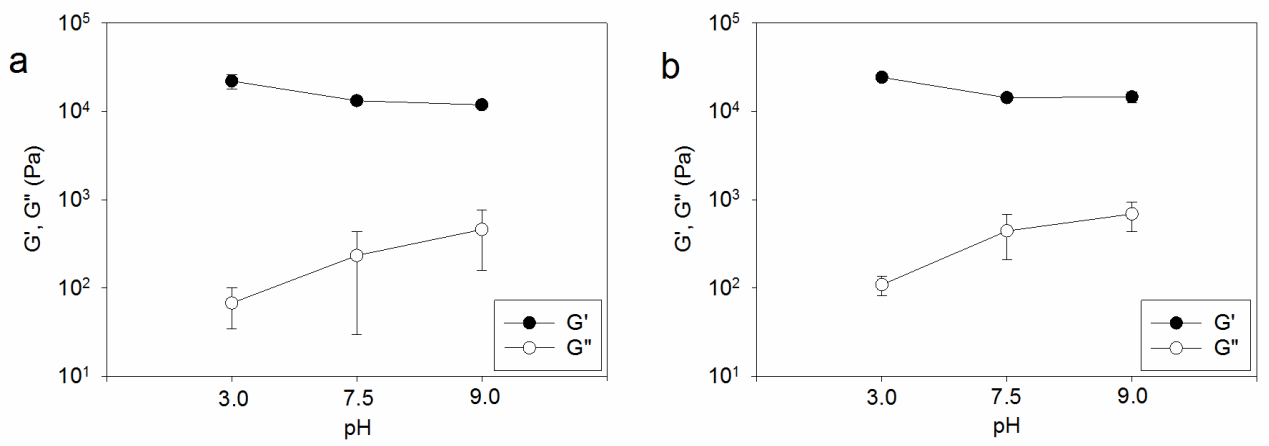

Figure S4. Storage (G', filled symbols) and loss (G", empty symbols) moduli for D0B10A20 (a), and D10B0A20 (b) equilibrated at pHs 3.0, 7.5 or 9.0 tested at a frequency of 1 Hz and 8 % strain (n = 3).

Table S2. Statistical analysis for work of adhesion (W_{adh}) and adhesion strength (S_{adh}) of adhesives tested against a wetted quartz substrate. Compositions not connected by the same letter at a given pH are significantly different.

	W_{adh}				S_{adh}			
Composition	pH 3.0	pH 7.5	pH 8.5	pH 9.0	pH 3.0	pH 7.5	pH 8.5	pH 9.0
D10B10A0	A	A	A	A	A	A	A	A
D10B10A10	C	A	A B	A B	C	A B	B	A
D10B10A20	A B	B	B	B	A B	B	B	A
D10B10A30	B	B	B	B	B C	B	B	A

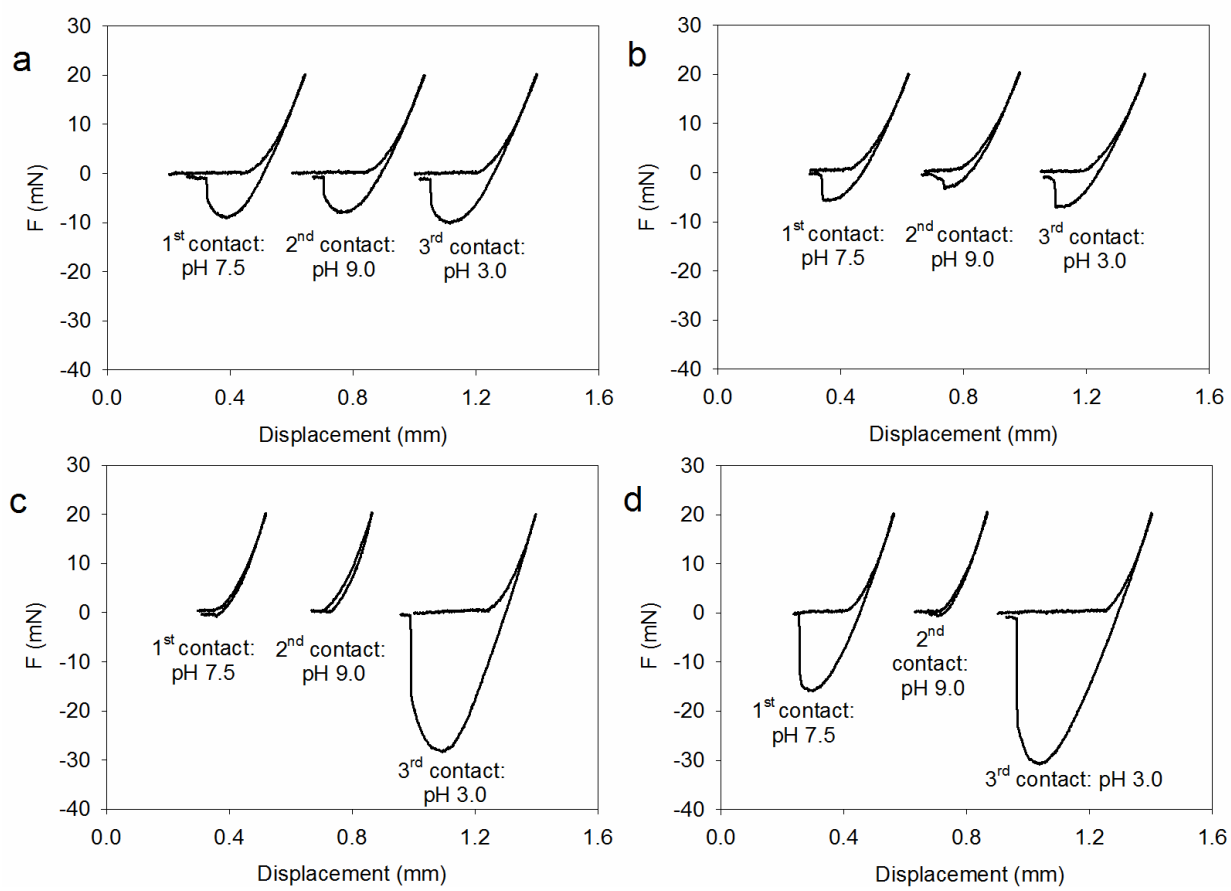

Figure S5. Three successive contact curves for D0B10A20 (a), D10B0A20 (b), D10B10A0 (c) and D10B10A20 (d) tested at pH 7.5, pH 9.0, and then pH 3.0 using a quartz substrate.