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Supporting Information

Selective Chemical Modification of Soy Protein for a Tough and Applicable Plant Protein-Based Material

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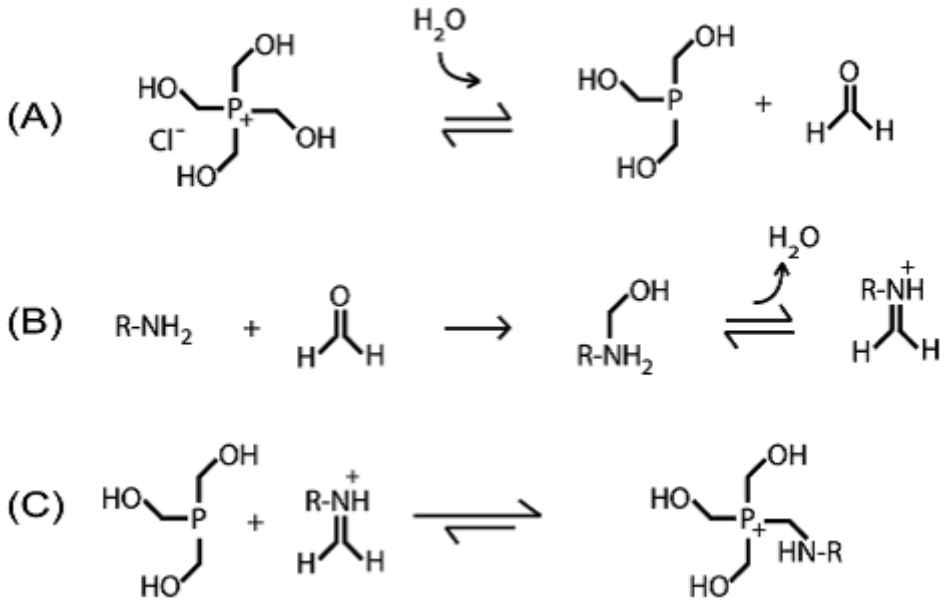

Scheme S1 Suggested THPC reaction mechanism. (A) Formation of formaldehyde to initiate hydroxymethyl arm replacement, (B) amine-formaldehyde reaction to yield an ammonium ion in a Mannich-type reaction, and (C) phosphorus reaction with the ammonium ion to complete the amine coupling.[1]

Table S1 Percentage of different count of unreacted hydroxymethyl arms in SPTCn samples (n=3)

sample	Three unreacted arms (%)	Two unreacted arms (%)	One unreacted arm (%)	Zero unreacted arm (%)
SPTC1	72.1	14.1	1.3	12.5
SPTC5	67.4	20.3	2.5	9.8
SPTC10	78.2	16.3	2.3	3.2

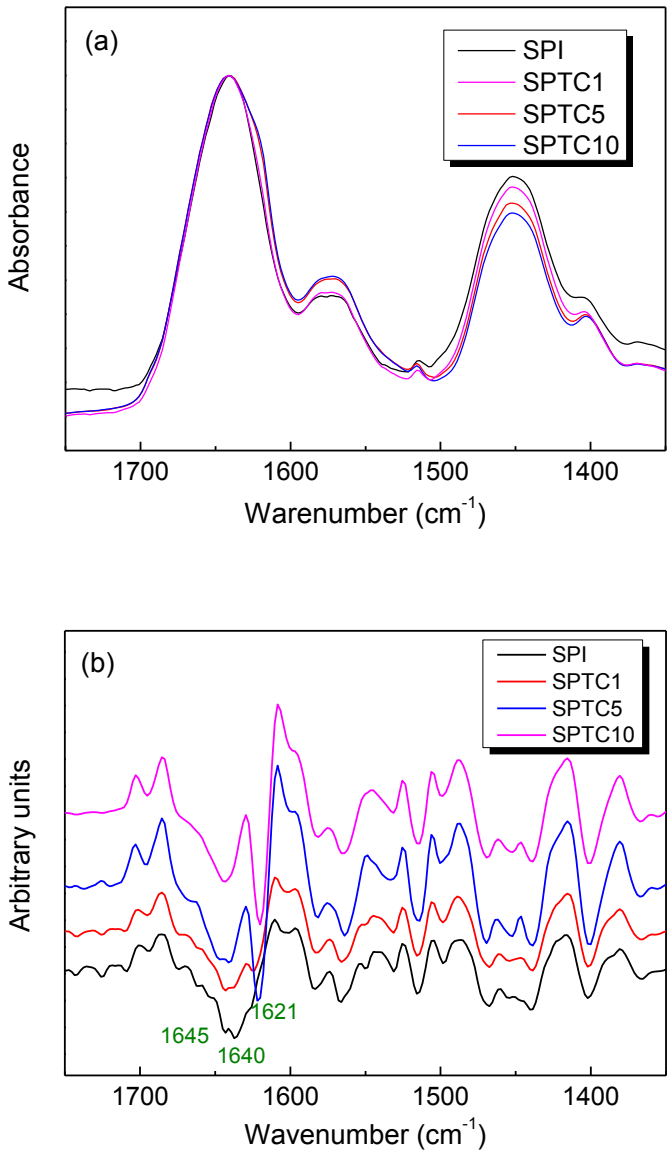

Fig. S1 Original FTIR spectra (a) and the second derivative spectra (b) of SPI and SPTCn solutions.

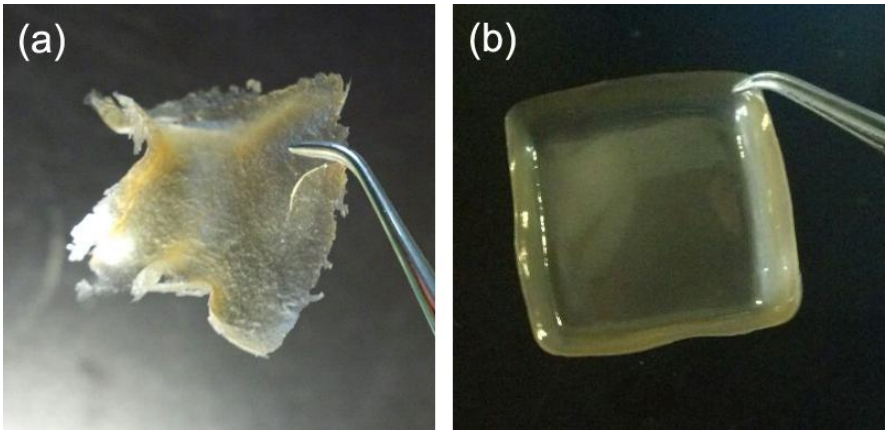

Fig. S2 Photographs of SPTC10 film (a) and SPTC5 film (b) in dry state (50% relative humidity).

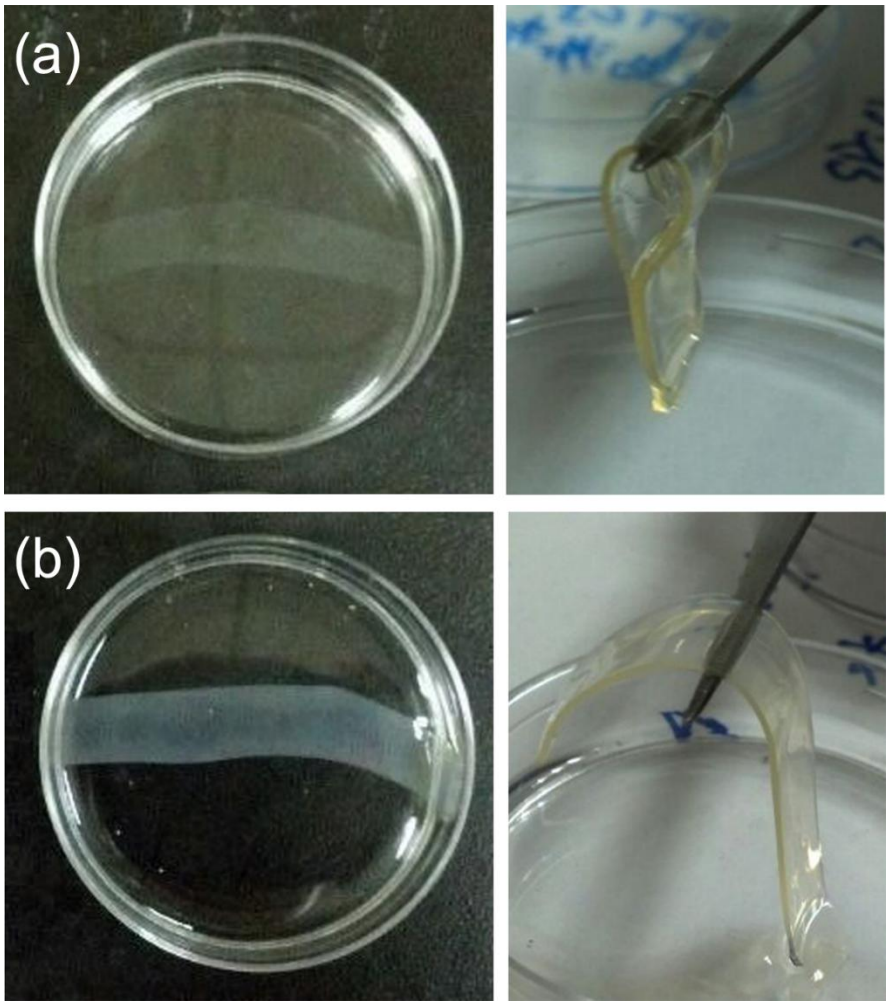

Fig. S3 Photographs of SPTC5 film in guanidine hydrochloride and dithiothreitol mixture solution (a) and deionized water (b) for 5 days.