

## Supporting Information

Table S1. XPS results of atomic contents of three precipitates: CS-30; CL-30; SA-30.

signal	atomic contents		
	CS-30	CL-30	SA-30
O 1s	51.94 %	48.93%	52.47%
N 1s	1.70 %	—	—
C 1s	27.47%	33.82%	27.83%
S 2p	2.92%	3.53%	2.36%
Ti 2p	15.97%	13.72%	17.34%

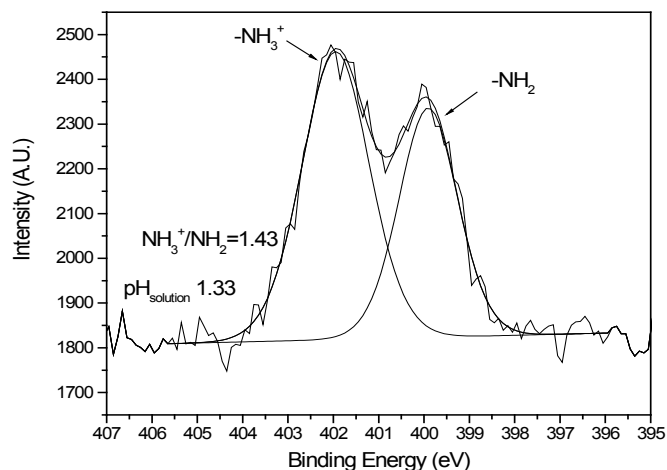


Fig. S1 XPS N 1s spectrum of precipitates mediated by chitosan at room temperature for 30 days.

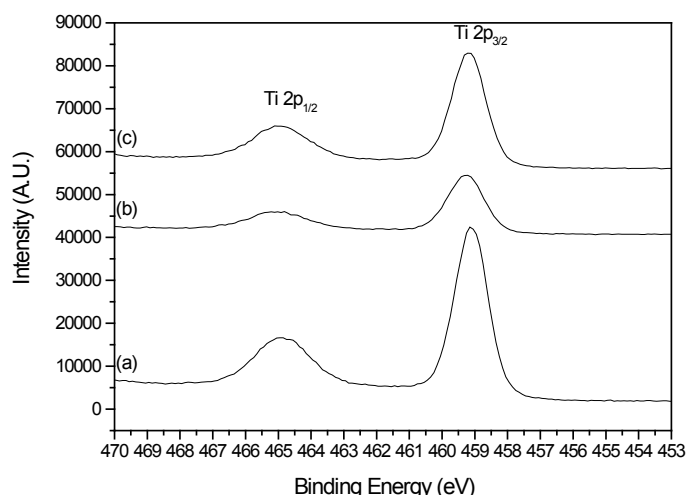
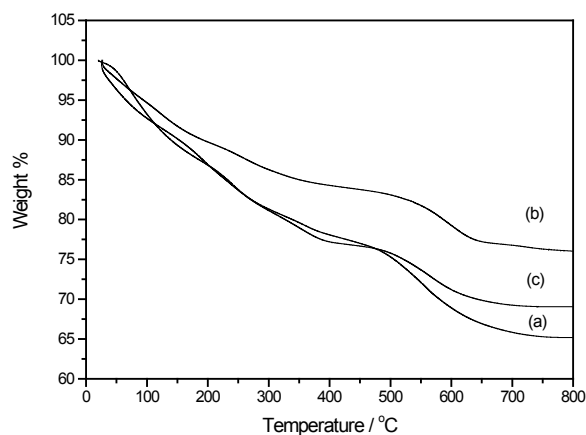
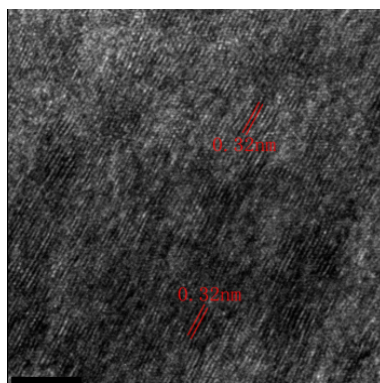


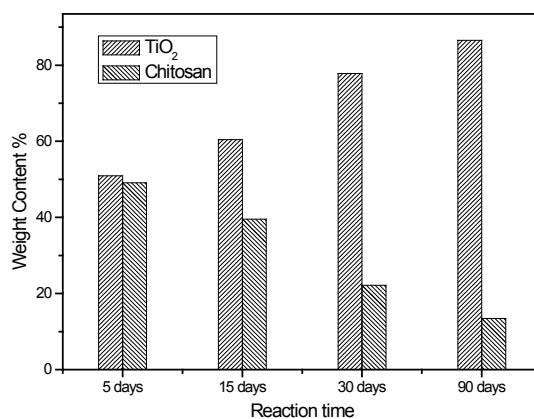
Fig. S2 XPS Ti 2p spectrums of three precipitates mediated by different glucan polymers at room temperature for 30 days: a) Chitosan; b) Cellulose; c) Sodium alginate.



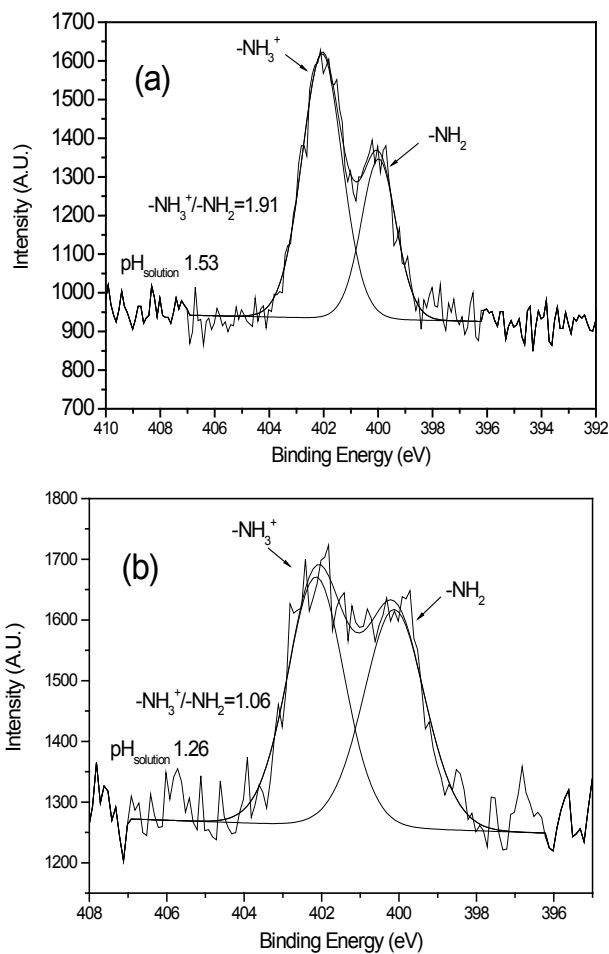
**Fig. S3** TGA scan of three precipitates mediated by different glucan polymers at room temperature for 30 days: a) Chitosan; b) Cellulose; c) Sodium alginate. The polymer account for 27.0%, 17.2% and 23.4% in weight in sample a, b, and c, respectively.



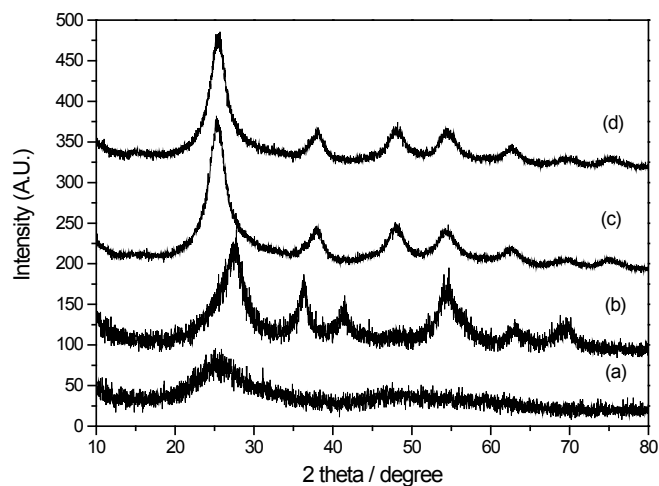
**Fig. S4** The high-resolution images of precipitates mediated by chitosan at room temperature for 90 days, bar 5nm.



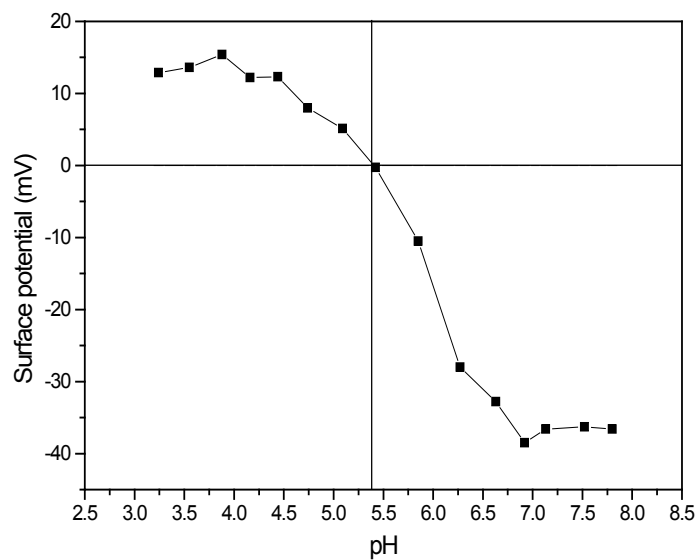
**Fig. S5** Diagram of TG analysis results of four samples mediated by chitosan at room temperature with different reaction time: 5 days; 15 days; 30 days; 90 days.



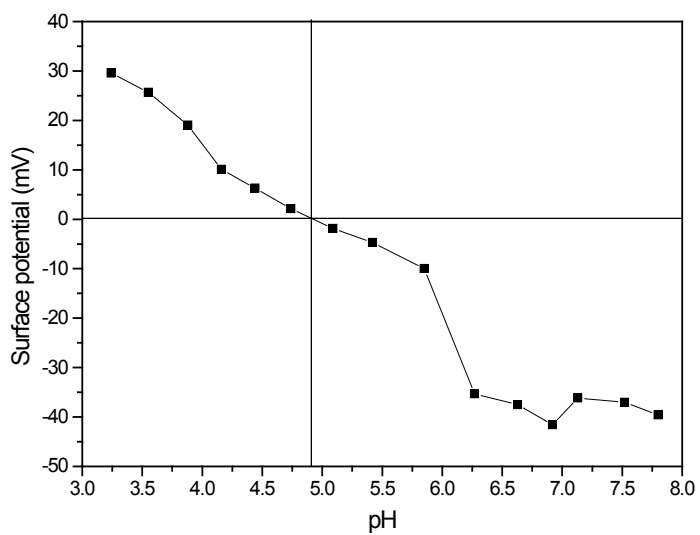
**Fig. S6** XPS results of N 1s spectrum of precipitates at 4 °C for 30 days (a), and 50 °C for 3 days (b).



**Fig. S7** XRD patterns of precipitates at different temperature and different reaction time: (a) amorphous precipitates obtained at 4 °C for 30 days; (b) precipitates obtained at room temperature for 30 days; (c) precipitates obtained at 50 °C for 3 days; (d) precipitates obtained at 50 °C for 3 days and following 27 days at room temperature.



(a)



(b)

**Fig. S8** Surface potential vs pH for two samples of anatase nanoparticles in an aqueous solution, the ionic strength is 0.03 M a) CS-15; b) CS50-3.