

Supporting information

Adaptive Control in Lubrication, Adhesion, and Hemostasis by Chitosan-Catechol-pNIPAM

Rongnian Xu^{a,b}, Shuanhong Ma^{a*}, Yang Wu^a, Haeshin Lee^c, Feng Zhou^{a*}, Weimin Liu^a

^a State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou 730000, China

^b University of Chinese Academy of Sciences, Beijing 100049, China

^c Department of Chemistry, Korea Advanced Institute of Science and Technology (KAIST), Daejeon 305-701, Republic of Korea

* Corresponding author: zhouf@licp.cas.cn; mashuanhong@licp.cas.cn

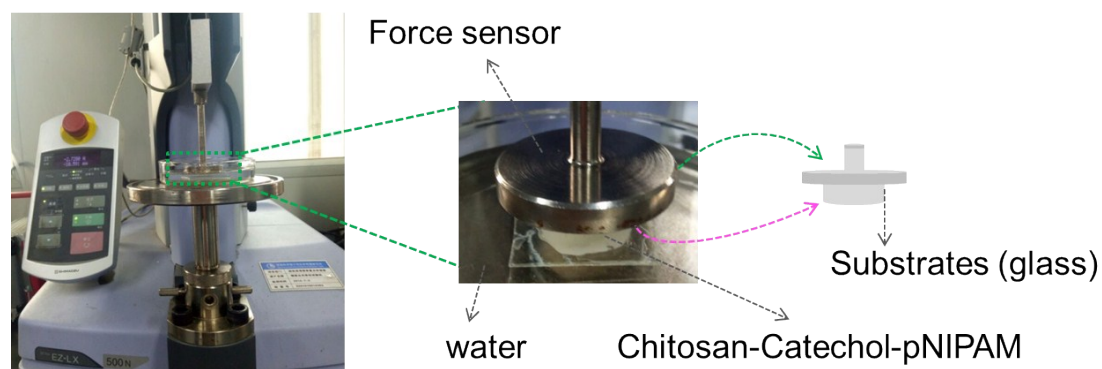


Figure S1. A schematics experimental setup for the adhesion test in water. The glass substrate was fixed on the load cell and moved upward to attach on the biomacromolecule wet adhesive and the target surface is detached from the adhesive and the adhesive force is measured by the load cell.

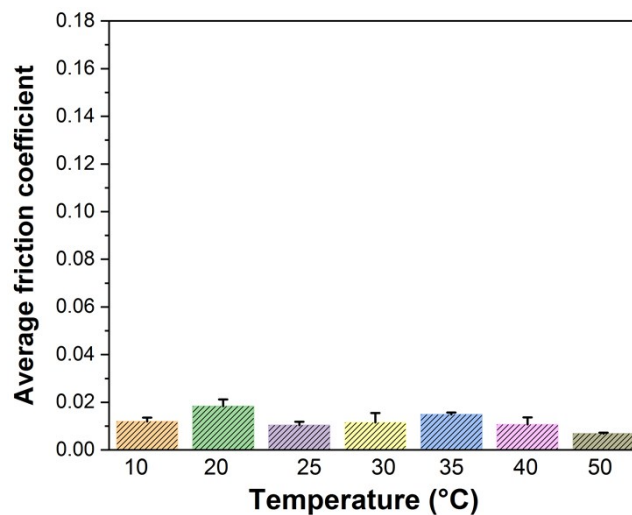


Figure S2. The average friction coefficient of as-prepared Chitosan-Catechol film against PDMS ball (diameter: 6 mm) in water bath with different temperatures under the load of 0.2 N and at frequency of 1 Hz.

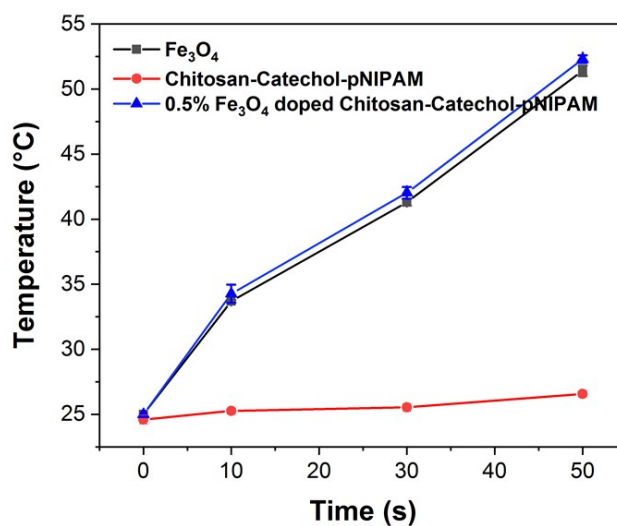


Figure S3. The change of temperature of CS-Catechol-pNIPAM (50 mg/mL)/ Fe_3O_4 (0.5wt%)/ Fe_3O_4 doped CS-Catechol-pNIPAM with the radiation time by Near-Infrared Radiation (NIR).

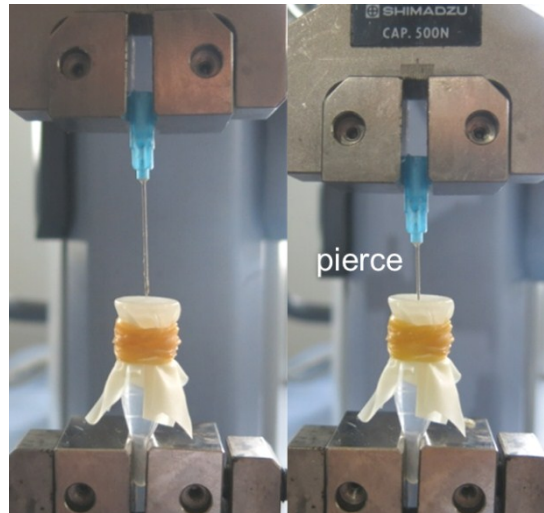


Figure S4. The optical photographs of the syringe needle coated samples before and after piercing the rubber gloves on the machine.

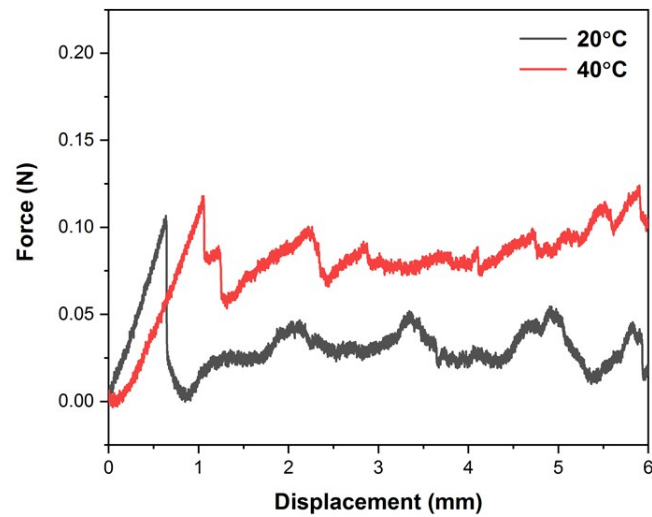


Figure S5. The force vs displacement curve of the syringe needle coated samples in 20°C and 40°C water bath under the compression mode with the 10 mm min⁻¹ crosshead velocity.

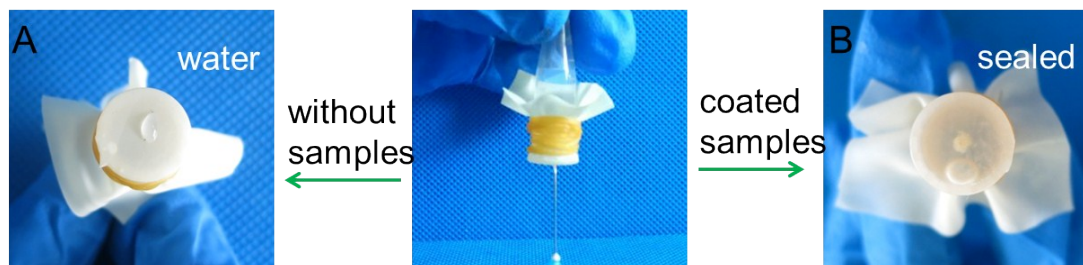


Figure S6. The optical photographs of the small test tube filled with distilled water and sealed with rubber glove after piercing with the syringe needle without (A) or with (B) samples.

Table S1. GPC results of Chitosan, Chitosan-Catechol and Chitosan-Catechol-pNIPAM.

Sample	Mn	Mw	Mw/Mn
Chitosan	6368	11210	1.760
Chitosan-Catechol	11150	17940	1.608
Chitosan-Catechol-pNIPAM	29550	691140	2.338