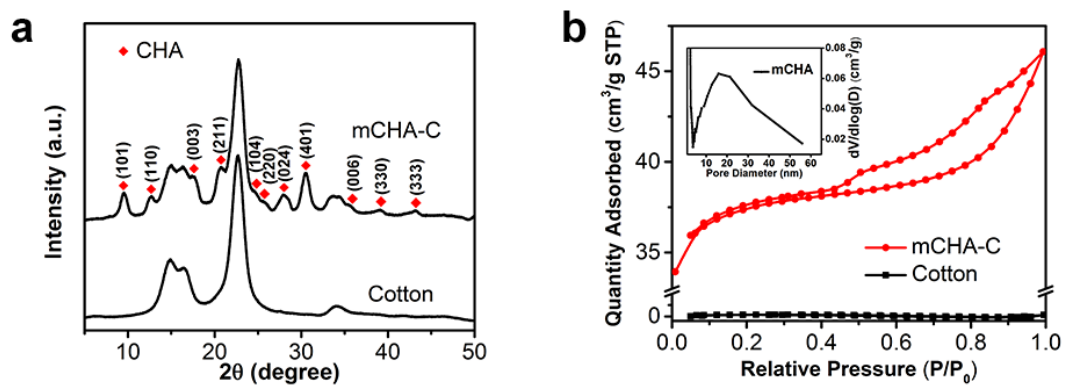


A Tightly-Bonded and Flexible Mesoporous Zeolite-Cotton Hybrid

Hemostat

Yu et al.



Supplementary Figure 1. (a) XRD patterns of mCHA-C and cotton. Source data are provided as a Source Data file. **(b)** Nitrogen sorption isotherm of mCHA-C and cotton, and pore size distribution of mCHA zeolite (inset). Source data are provided as a Source Data file.

Supplementary Table 1

The mCHA content on the cotton.

Sample	1	2	3	Mean	Standard Deviation
mCHA Content (wt%) [#]	22.5	23.5	24.0	23.3	0.8

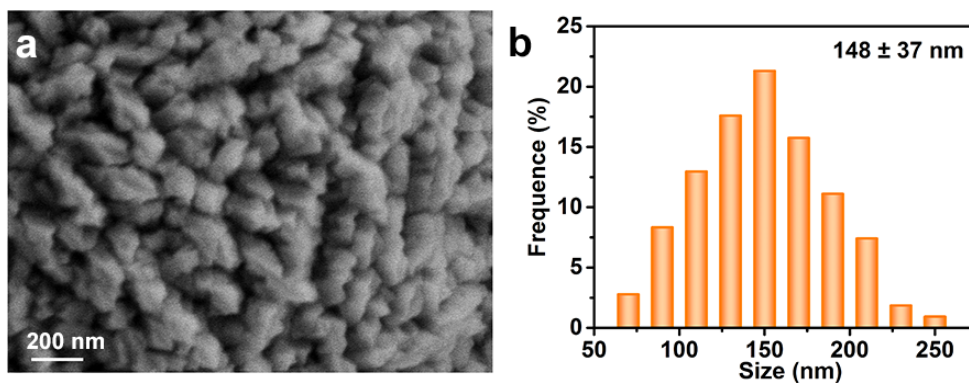
[#] The mCHA content was measured by thermogravimetry analysis (TGA).

Supplementary Table 2

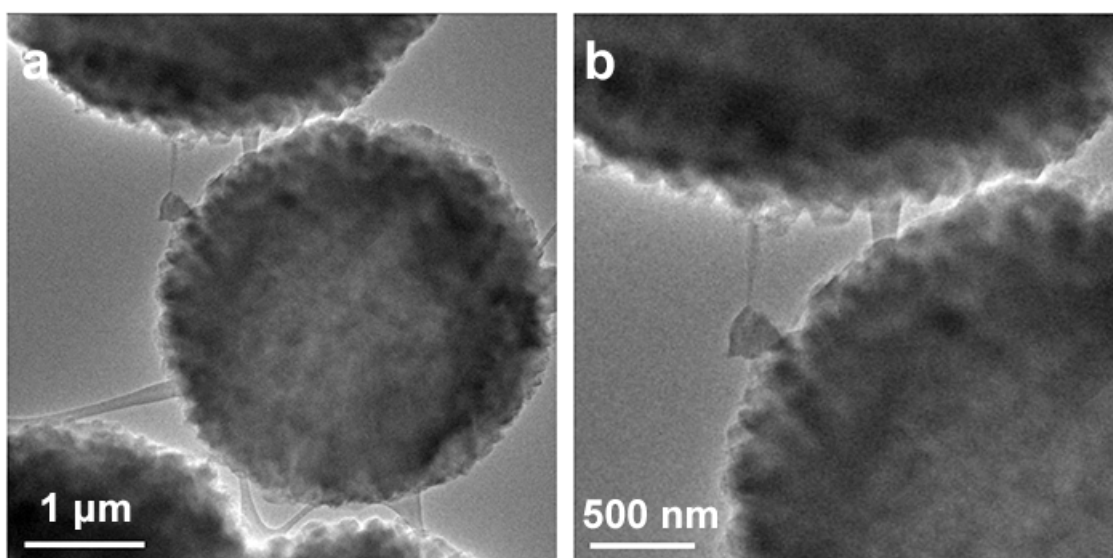
Nitrogen sorption data of cotton, mCHA-C, and mCHA zeolite.

Samples	BET surface area (m² g⁻¹)	Micropore volume (m³ g⁻¹)	Mesopore volume (m³ g⁻¹)
Cotton	1.0	-	-
mCHA-C	114	0.052	0.019
mCHA [#]	489	0.22	0.08

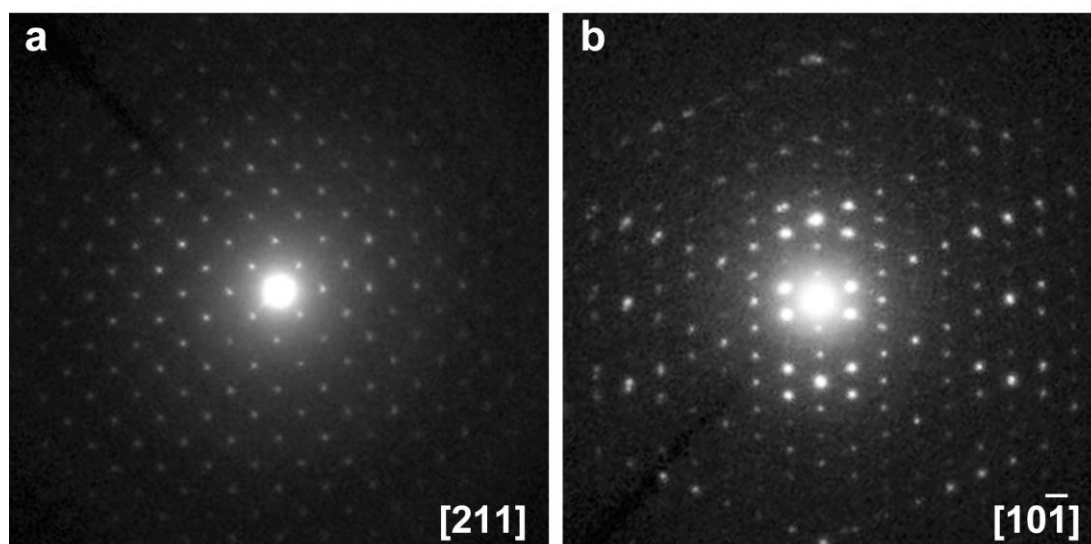
[#] The cotton itself is nonporous, which shows a negligible surface areas (1.0 m² g⁻¹). Nitrogen sorption data of mCHA zeolite was estimated by subtracting the sorption from cotton.



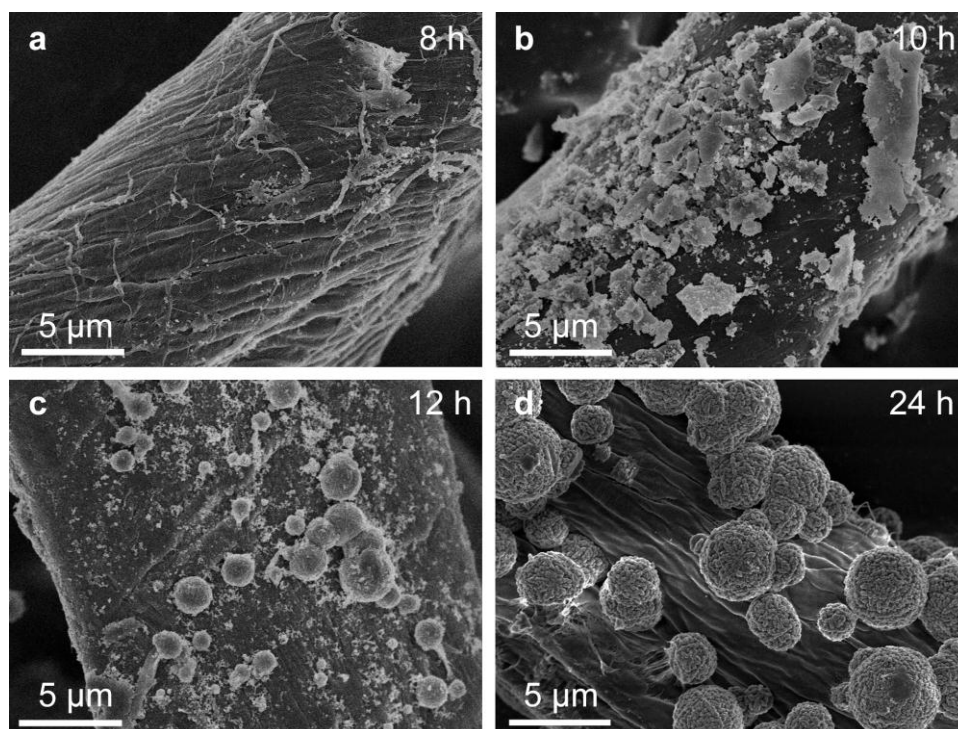
Supplementary Figure 2. (a) FE-SEM image of mCHA on the cotton. (b) Size distribution of CHA nanocrystals observed by FE-SEM images. Source data are provided as a Source Data file. Each sphere CHA is consisted of nanocrystals with a size of 148 ± 37 nm; data values corresponded to mean $\pm$ standard deviation, $n = 108$.



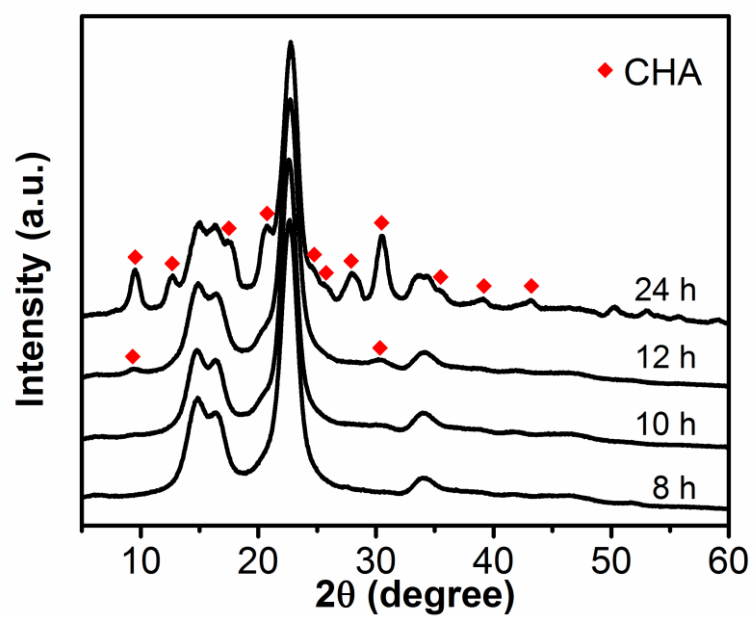
Supplementary Figure 3. Low-magnification TEM image of spherical mCHA zeolite on the cotton.



Supplementary Figure 4. Electron diffraction patterns of individual CHA crystal taken along the **(a)** $[211]$ and **(b)** $[10\bar{1}]$ zone axes, respectively.



Supplementary Figure 5. FE-SEM images of mCHA-C samples at different time intervals.



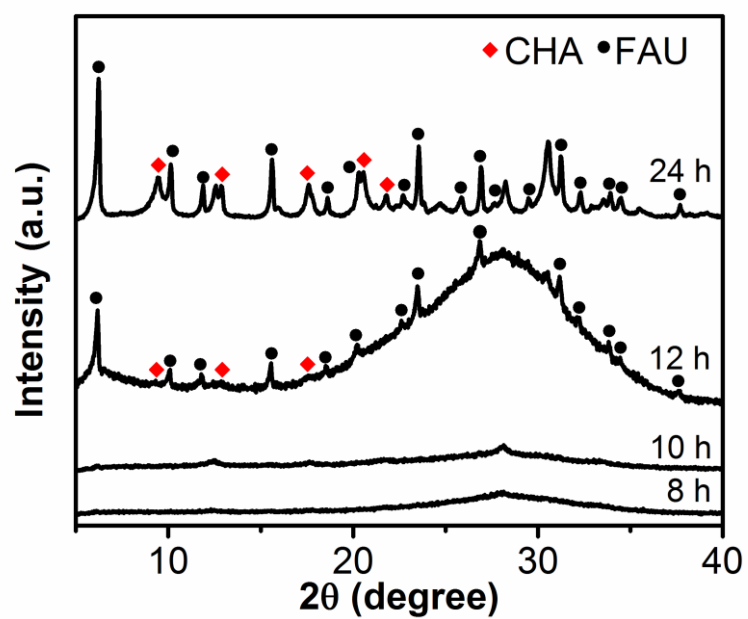
Supplementary Figure 6. XRD patterns of mCHA-C samples at different time intervals. Source data are provided as a Source Data file.

Supplementary Table 3

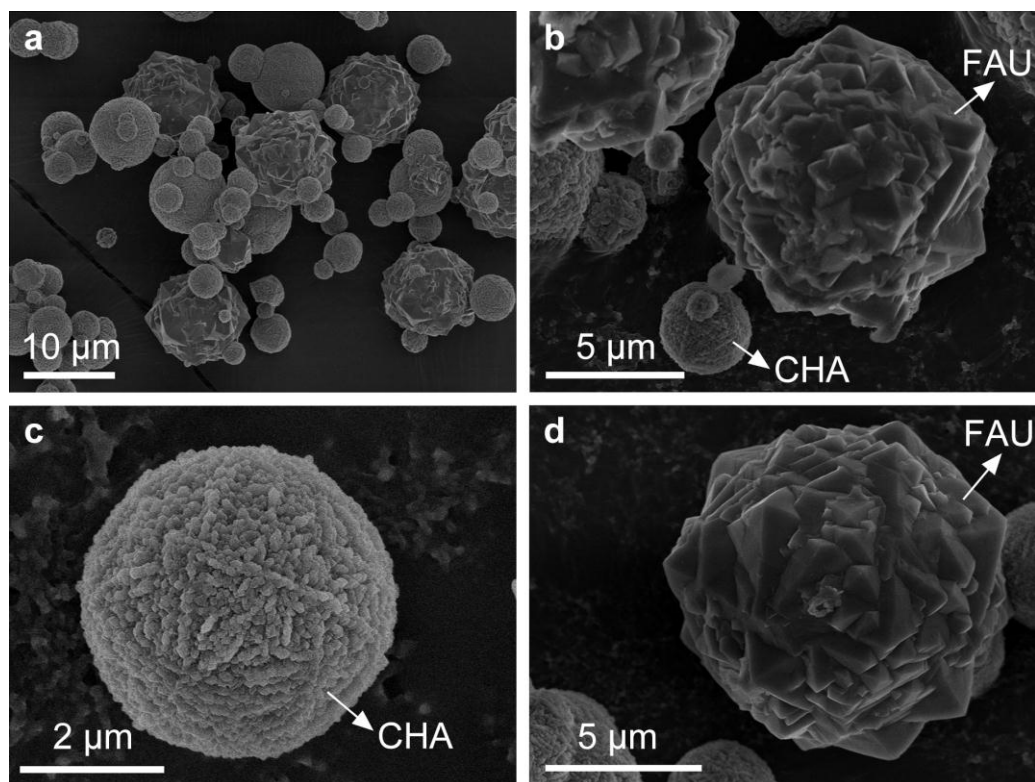
The solid contents on the cotton surface of mCHA-C samples at different time intervals.

Time Points	8 h	10 h	12 h	24 h
Solid content (wt%) [#]	5.4	10.2	10.7	23.5

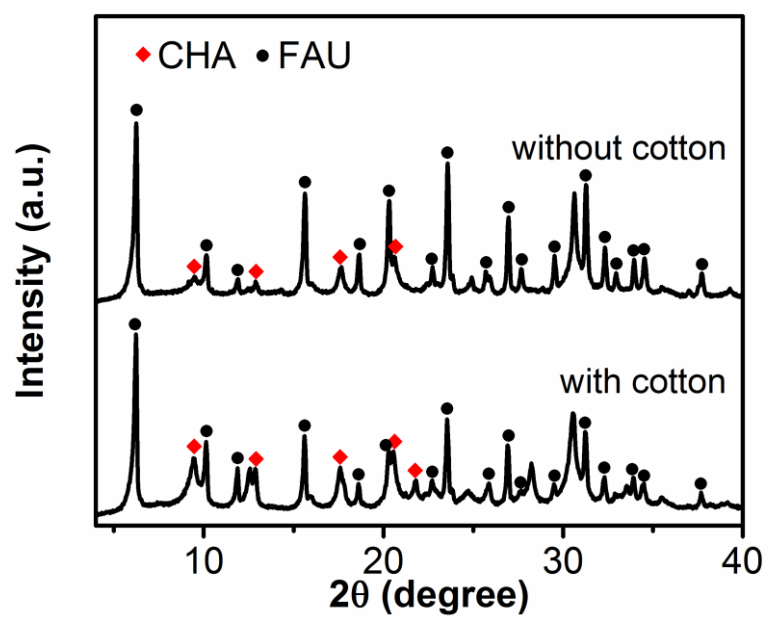
[#] The solid content was measured by TGA.



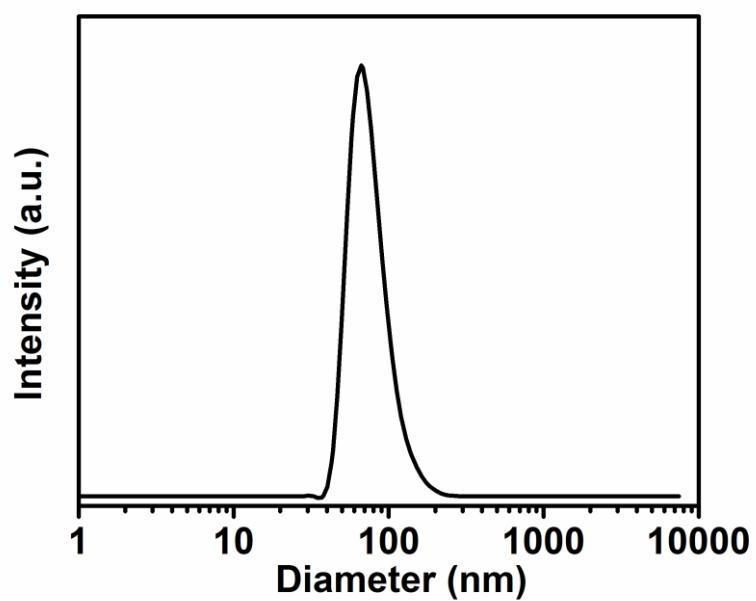
Supplementary Figure 7. XRD patterns of the in-solution products at different time intervals. Source data are provided as a Source Data file.



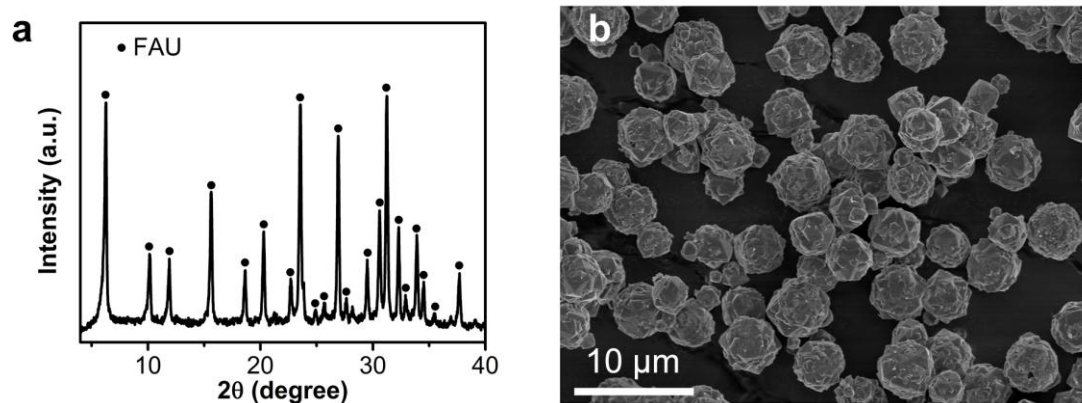
Supplementary Figure 8. (a, b) FE-SEM images of in-solution products in the mCHA-C synthesis. High-magnification FE-SEM images of (c) CHA and (d) FAU in solution products. CHA zeolite in solution was spherical aggregates, while another solution product was highly-crystalline and bulk FAU zeolite, of which the size was ca. 10 μm .



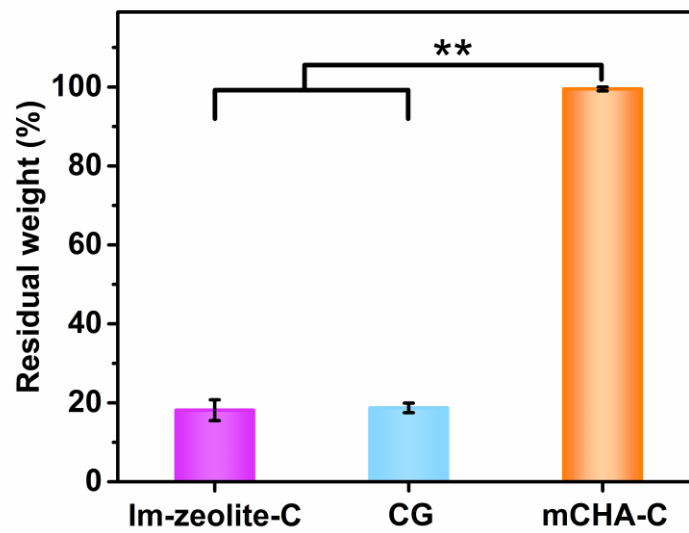
Supplementary Figure 9. XRD patterns of in-solution products with and without cotton. Source data are provided as a Source Data file.



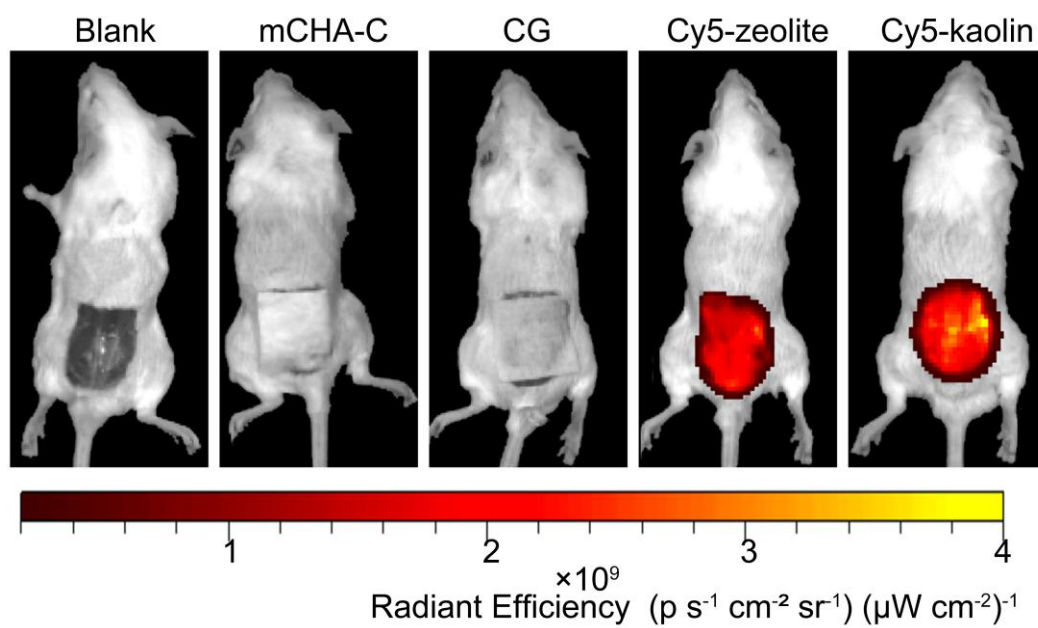
Supplementary Figure 10. DLS curve for the gel particles synthesized at room temperature for 24 h. Source data are provided as a Source Data file.



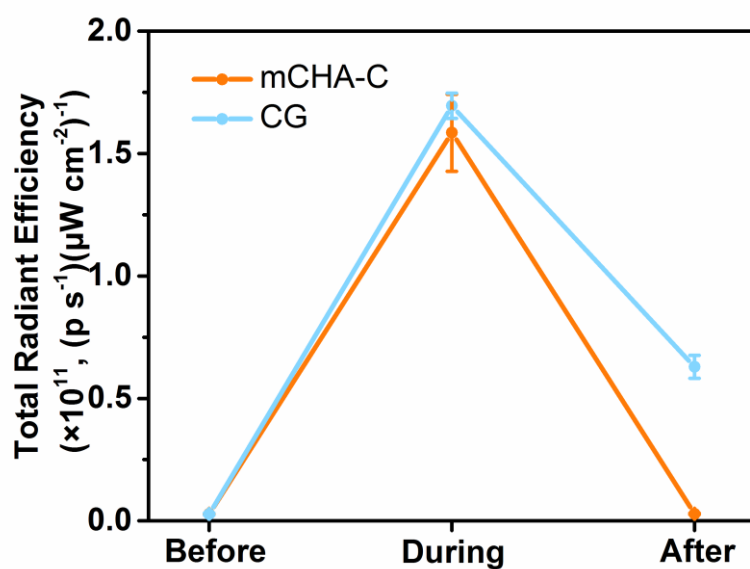
Supplementary Figure 11. (a) XRD pattern and (b) FE-SEM image of in-solution product from adding cotton after formation of gel particles. Source data are provided as a Source Data file.



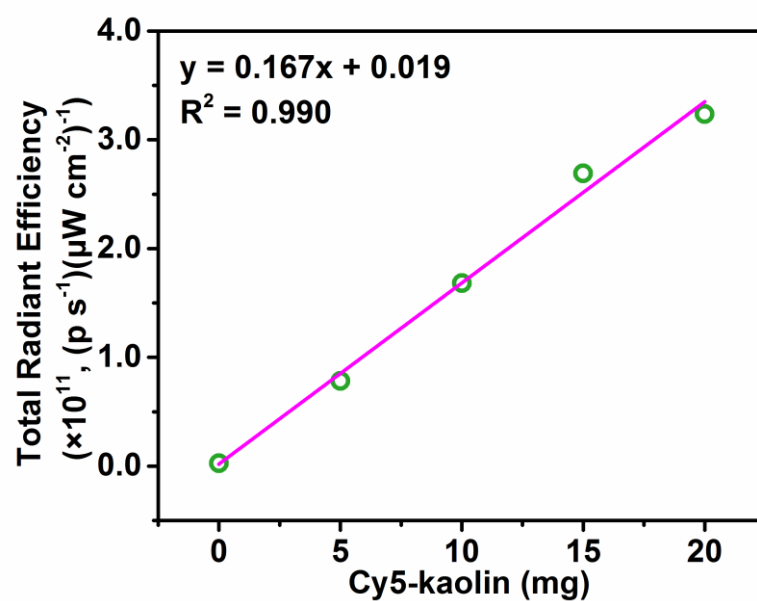
Supplementary Figure 12. The relative residual weight of hemostatic component after washing with deionized water. Source data are provided as a Source Data file. Data values corresponded to mean $\pm$ standard deviation, $n = 3$. Error bars represent standard deviation. ** $P < 0.01$, one-way analysis of variance (ANOVA).



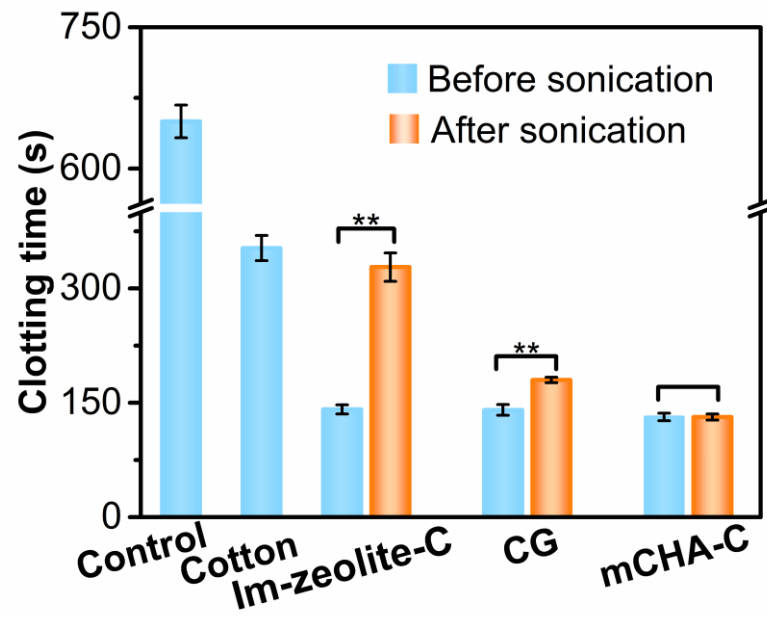
Supplementary Figure 13. Fluorescence imaging of mice skin wound during being treated with mCHA-C, CG, Cy5-zeolite (Cy5-labeled zeolite) and Cy5-kaolin (Cy5-labeled kaolin), respectively.



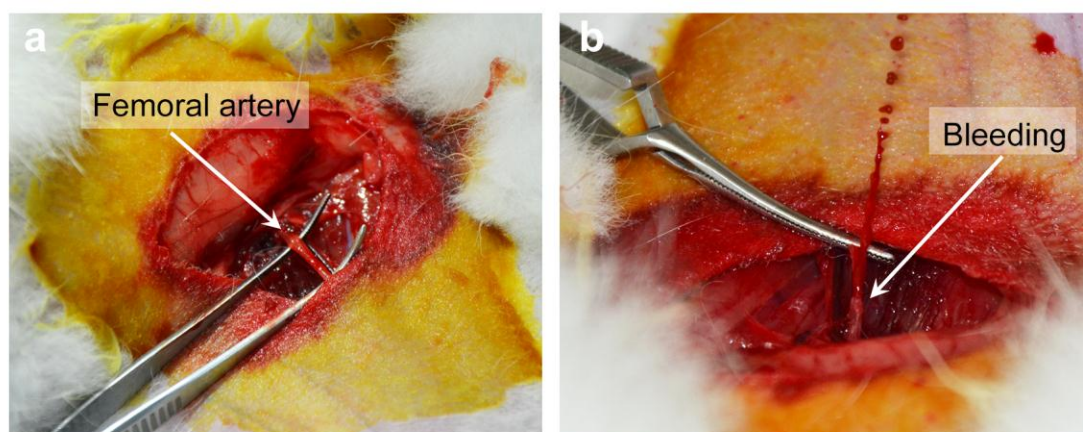
Supplementary Figure 14. Total fluorescent radiant efficiency of mice skin wound before, during and after being treated with Cy5-labeled mCHA-C (orange) and CG (turquoise), respectively. Source data are provided as a Source Data file. Data values corresponded to mean $\pm$ standard deviation, $n = 3$. Error bars represent standard deviation.



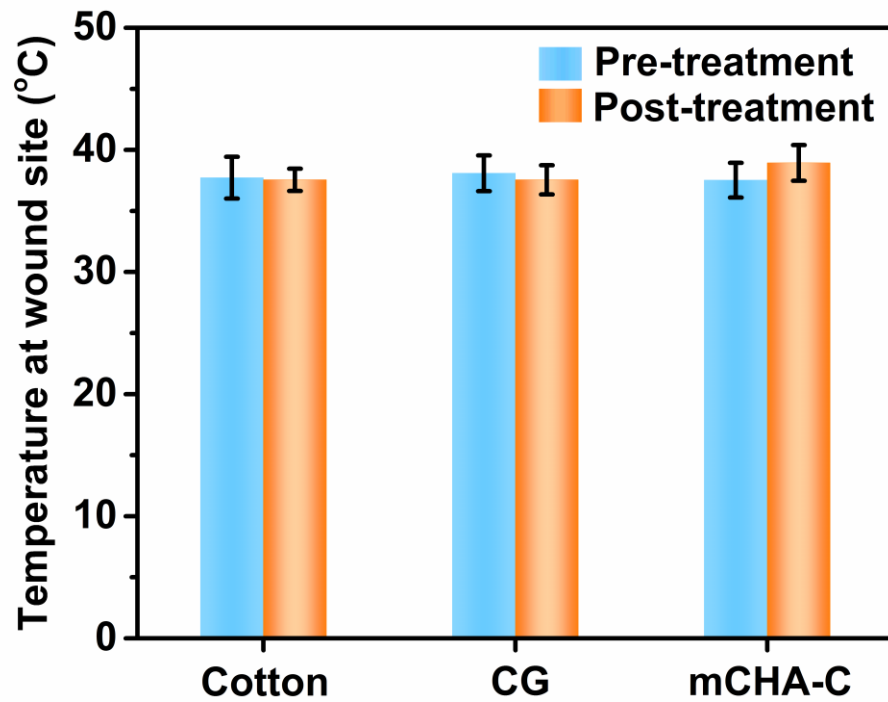
Supplementary Figure 15. Working curve for total fluorescent radiant efficiency of mice skin wound used with Cy5-labeled kaolin. Source data are provided as a Source Data file.



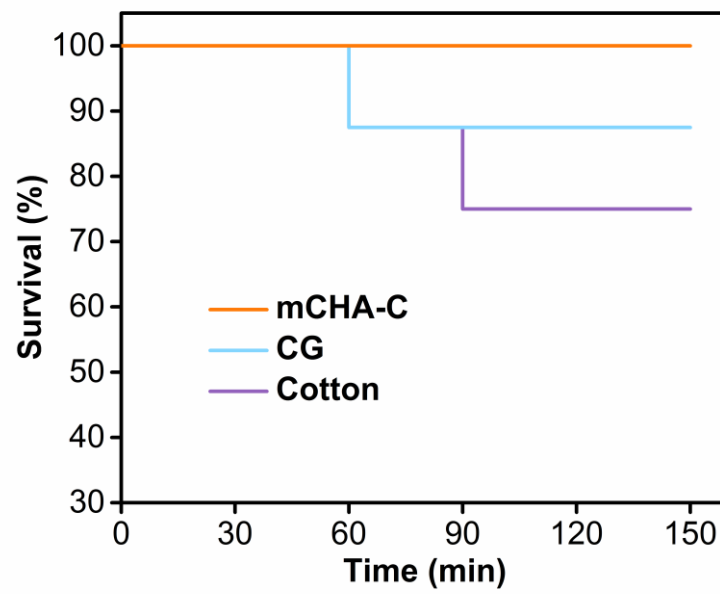
Supplementary Figure 16. Plasma clotting time of hemostats before and after 10 min sonication. Source data are provided as a Source Data file. Data values corresponded to mean $\pm$ standard deviation, $n = 3$. Error bars represent standard deviation. ** $P < 0.01$, one-way analysis of variance (ANOVA).



Supplementary Figure 17. The femoral artery was **(a)** exposed and **(b)** transected to make fatal blood loss in the rabbit femoral artery injury model.



Supplementary Figure 18. Thermal effect of cotton, CG and mCHA-C in the rabbit femoral artery injury model. Source data are provided as a Source Data file. Data values corresponded to mean $\pm$ standard deviation, $n = 8$. Error bars represent standard deviation.



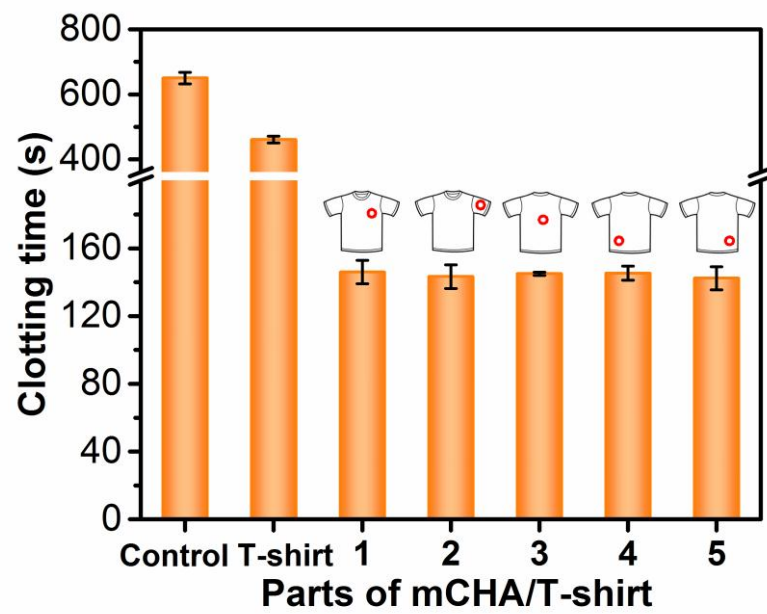
Supplementary Figure 19. Survival analysis of rabbits treated with mCHA-C (orange), CG (turquoise) and cotton (violet) in the fatal femoral artery injure model. Source data are provided as a Source Data file.

Supplementary Table 4

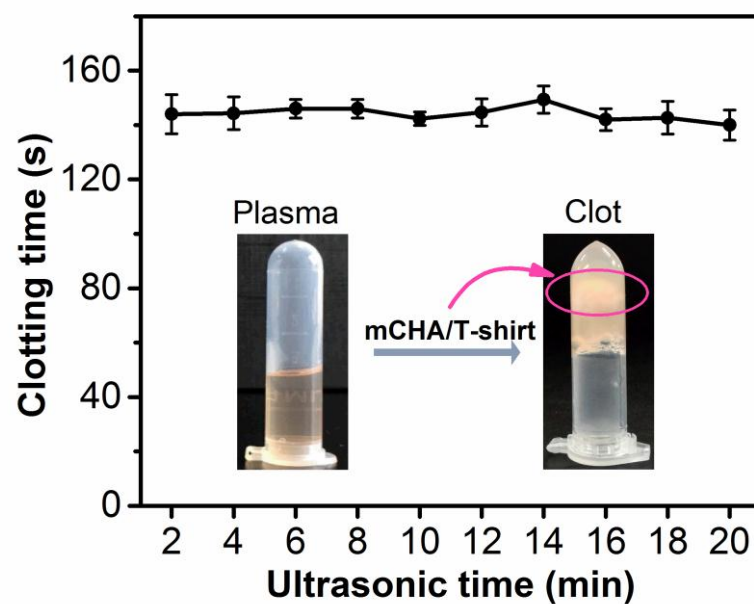
The mCHA content on T-shirt.

Sample	1	2	3	Mean	Standard Deviation
mCHA content (wt%) [#]	22.2	21.6	21.2	21.7	0.5

[#] The mCHA content of mCHA/T-shirt was measured by TGA.



Supplementary Figure 20. The plasma clotting time of five parts of mCHA/T-shirt. Source data are provided as a Source Data file. Data values corresponded to mean $\pm$ standard deviation, $n = 3$. Error bars represent standard deviation.



Supplementary Figure 21. The plasma clotting time of mCHA/T-shirt after different ultrasonic time. Source data are provided as a Source Data file. Data values corresponded to mean $\pm$ standard deviation, $n = 3$. Error bars represent standard deviation.