

A Rapid Hemostatic Sponge Based on Large, Mesoporous Silica Nanoparticles and N-alkylated Chitosan

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A rapid and safe hemostatic material was developed by trapping large, mesoporous silica nanoparticles in an N-alkylated chitosan sponge. Due to the designed, coagulation-promoting microstructure, MSN-GACS has excellent hemostatic efficiency, as shown by in vitro clotting and hemostasis evaluations.

Table S1. The results of N₂ adsorption study of MSNs and MSN-GACS

	PSD (nm)	D _{TEM} (nm)	S _{BET} (m ² /g)	V _t (cm ³ /g)	D _{BJH} (nm)
MSNs	65 ± 14	15.3 ± 2.0	426	1.446	61.6 ± 5
MSN-GACS	--	--	385	0.873	17.3 ± 2

* The particle size distribution (PSD) was decided by measuring the diameters of more than 100 particles under TEM. D_{TEM} was the pore diameter calculated by measuring the pore diameters in more than 50 particles under TEM. S_{BET} was the specific surface area measured from N₂ adsorption. V_t was the total internal pore volume measured at P/P₀=0.99. D_{BJH} was the pore diameter evaluated by the BJH theoretical model.

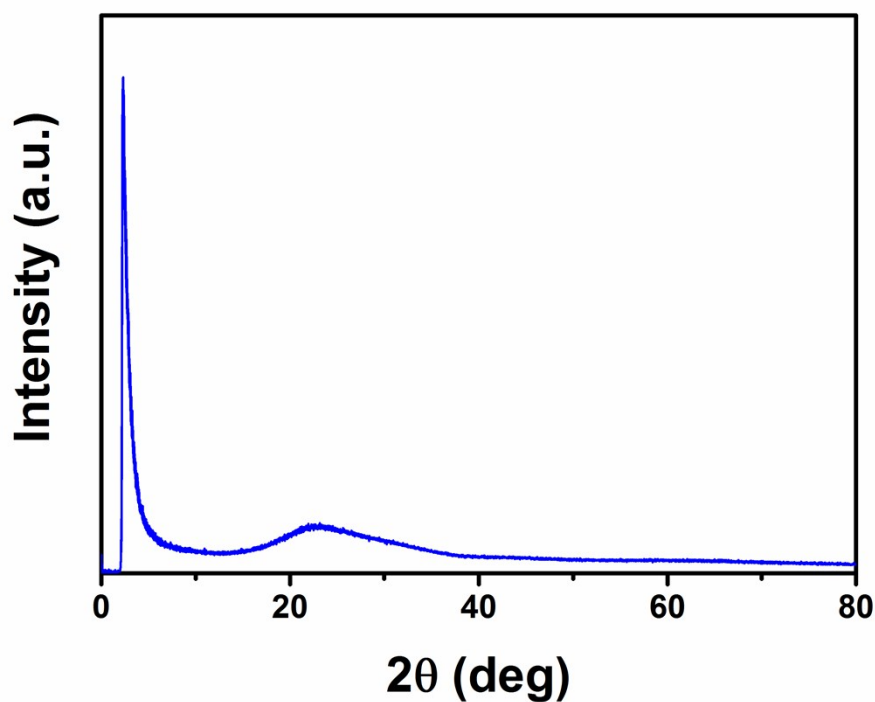


Figure S1. XRD pattern of the MSNs.

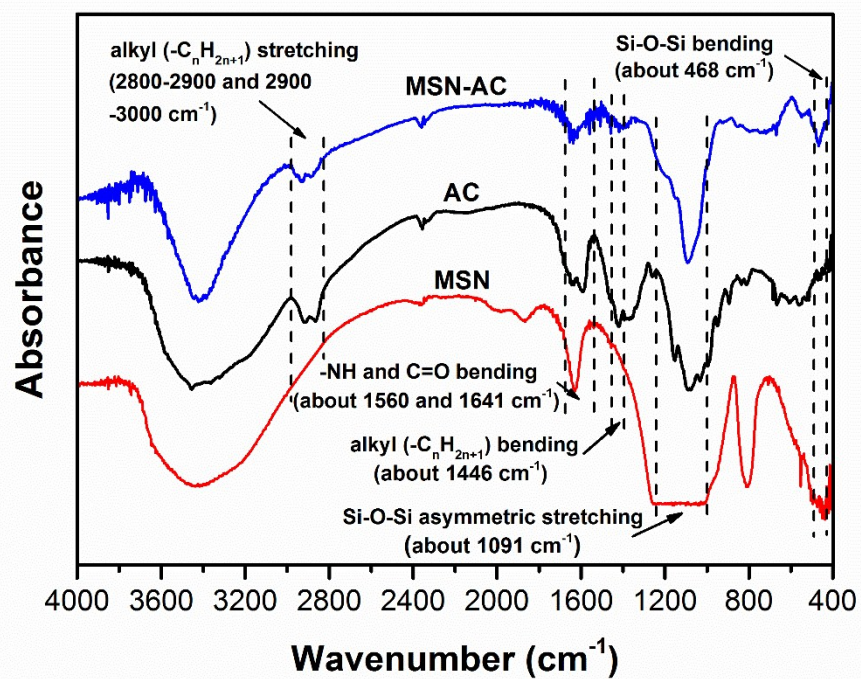


Figure S2. FTIR spectra of the MSNs, AC and MSN-GACS.

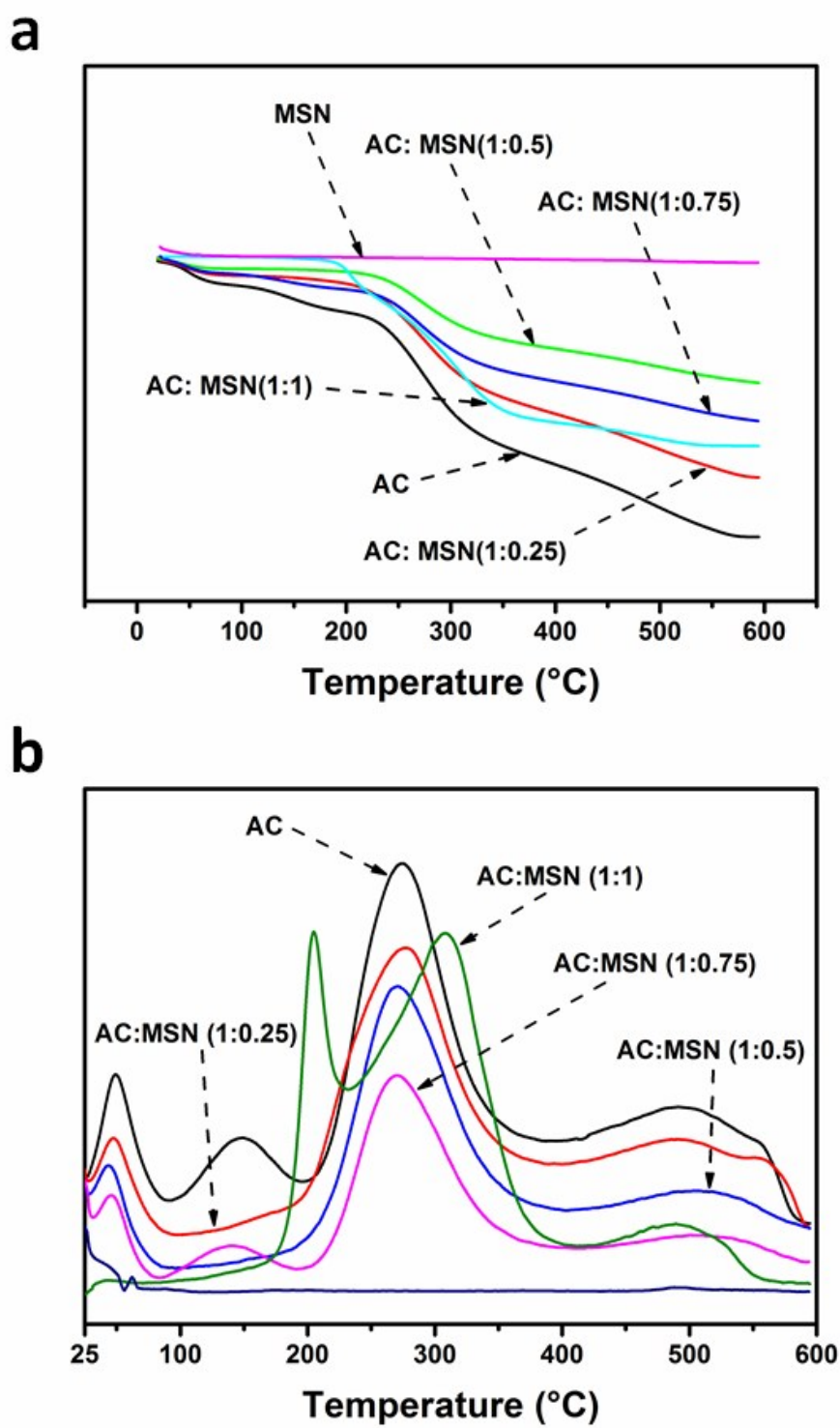


Figure S3. TGA (a) and DTG (b) curves of AC, the MSNs and MSN-AC mixtures with different ratios of AC to MSN.

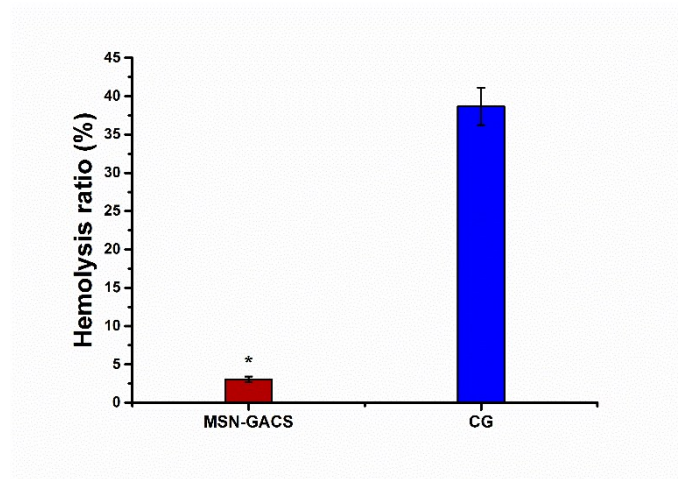


Figure S4. The hemolysis ratio of MSN-GACS and CG. * meant significant difference compared with CG.
