Electronic Supplementary Material (ESI) for Soft Matter

Supporting Information

Ultralight and Highly Flexible Aerogels with Long Cellulose I Nanofibers

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Table 1 Porosity of the aerogels obtained from hydrogels with different solid content.

Aerogels	aerogel-01	aerogel-02	aerogel-05	aerogel-08	aerogel-10	aerogel-15
Porosity (%)	99.91	99.86	99.69	99.37	99.17	98.94

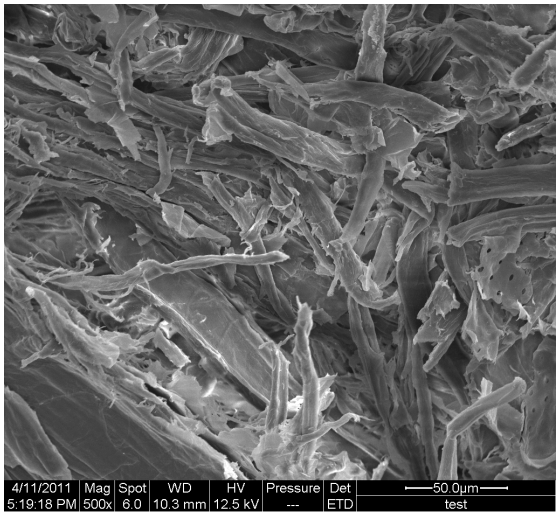

Fig. S1 SEM image of the chemically purified cellulose fibers.

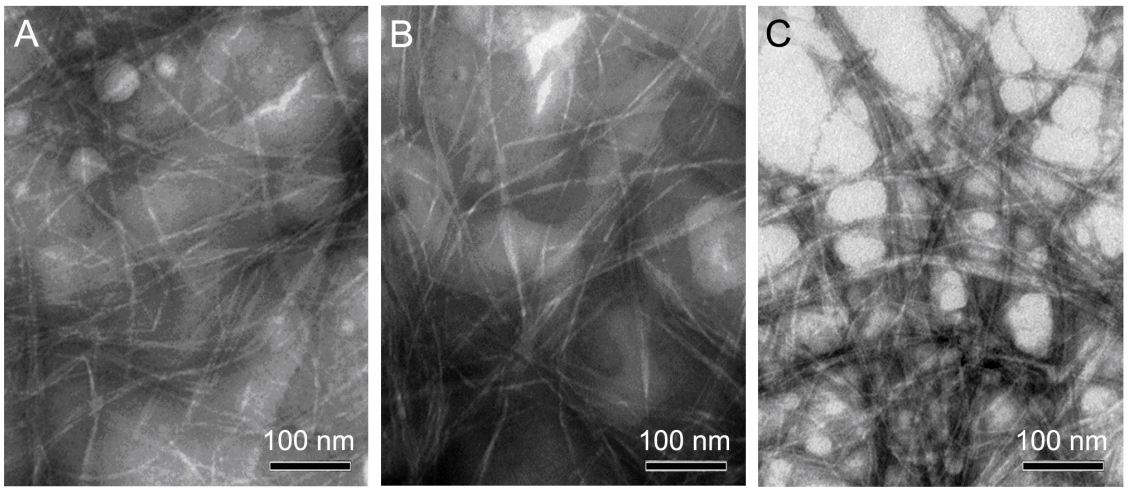

Fig. S2 TEM images of (A) hydrogel-02, (B) hydrogel-08 and (C) hydrogel-15.

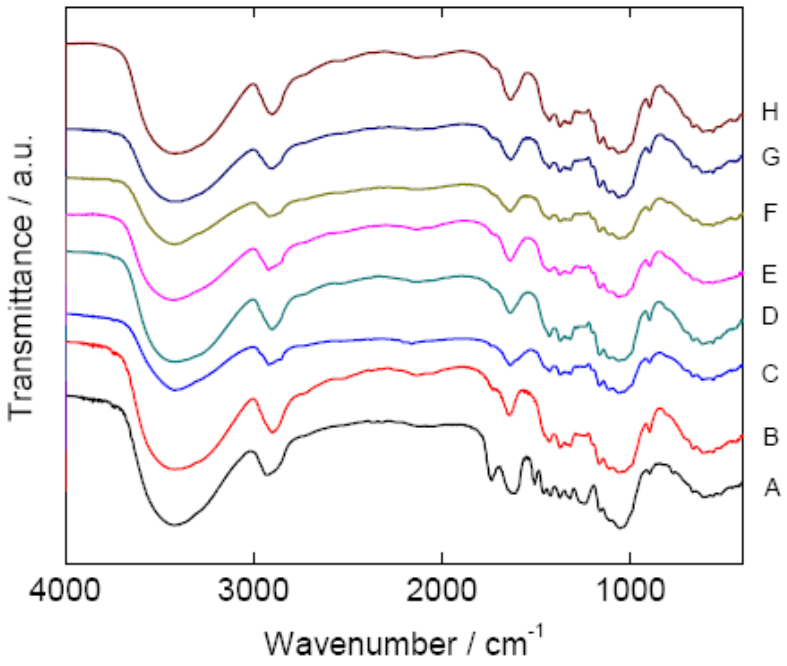

Fig. S3 FT-IR spectra of (A) raw wood fibers, (B) chemically purified cellulose fibers, (C) hydrogel-01, (D) hydrogel-02, (E) hydrogel-05, (F) hydrogel-08, (G) hydrogel-10 and (H) hydrogel-15.

Fig. S4 Photograph of aerogel-02. Due to the extremely low density of the aerogel, electrostatic charge is sufficient to make the sample stick to a finger in a way seemingly defying gravity.

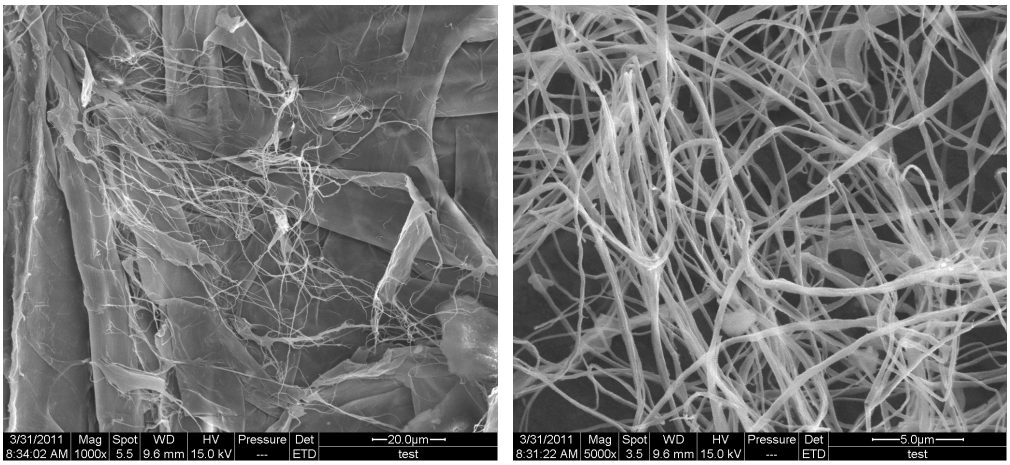

Fig. S5 SEM images showing that some long nanofibers with uniform width 30-150 nm were still existed in aerogel-05.

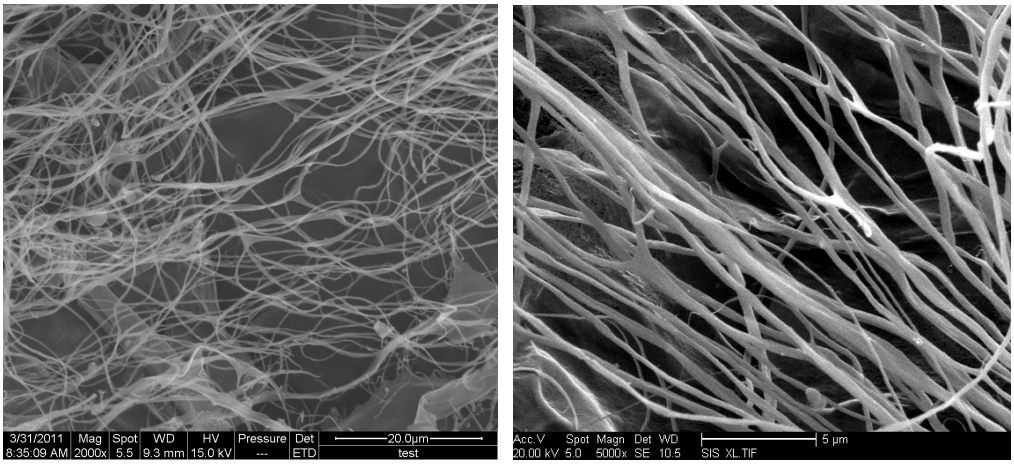

Fig. S6 SEM images showing that some long nanofibers with uniform width 30-150 nm were still existed in aerogel-08.

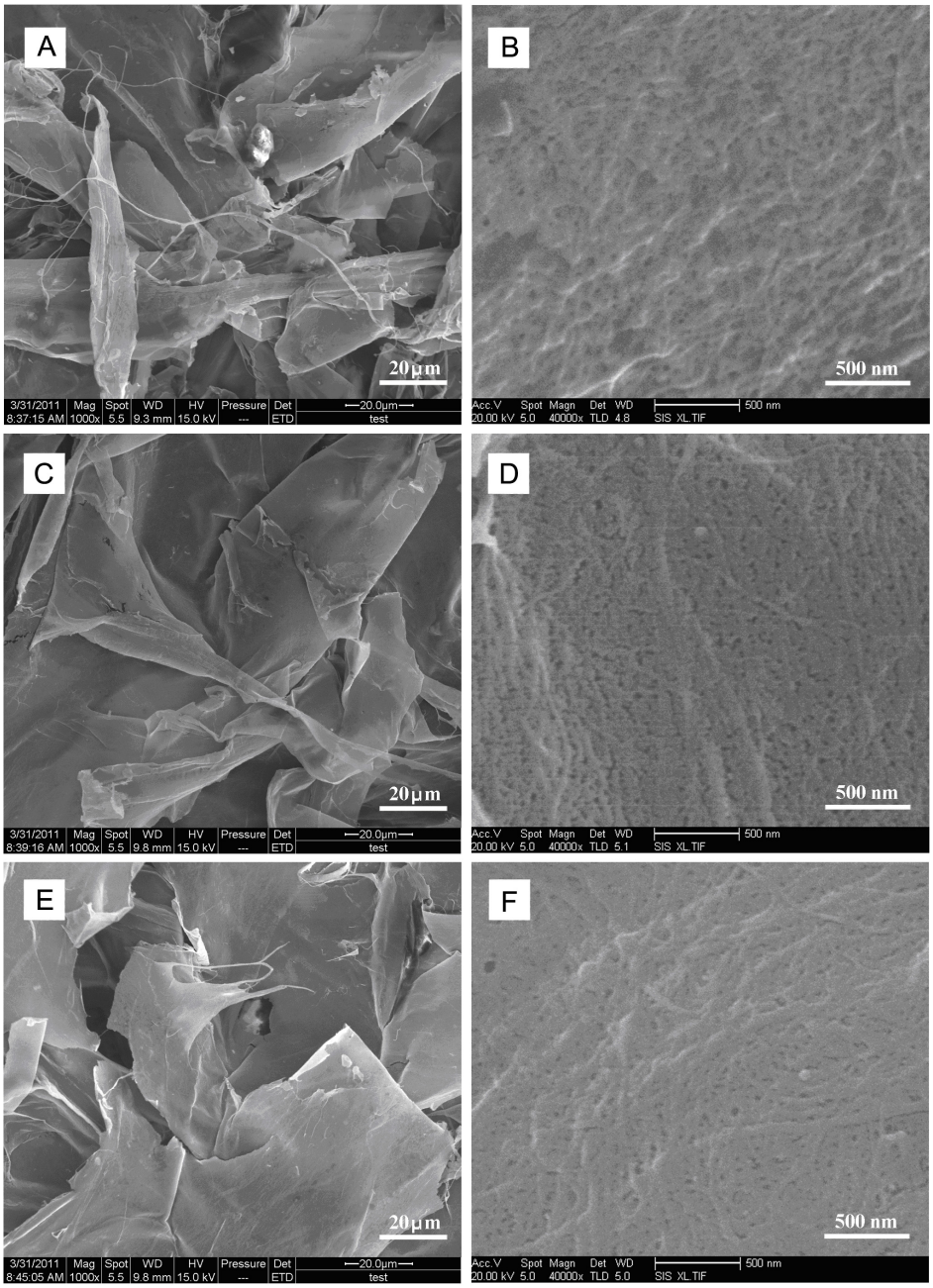

Fig. S7 SEM images of aerogel-08 (A, B), aerogel-10 (C, D) and aerogel-15 (E, F). (A,C,E) Low-magnification (×1000) and (B,D,F) high-magnification (×40000) images of the aerogels.

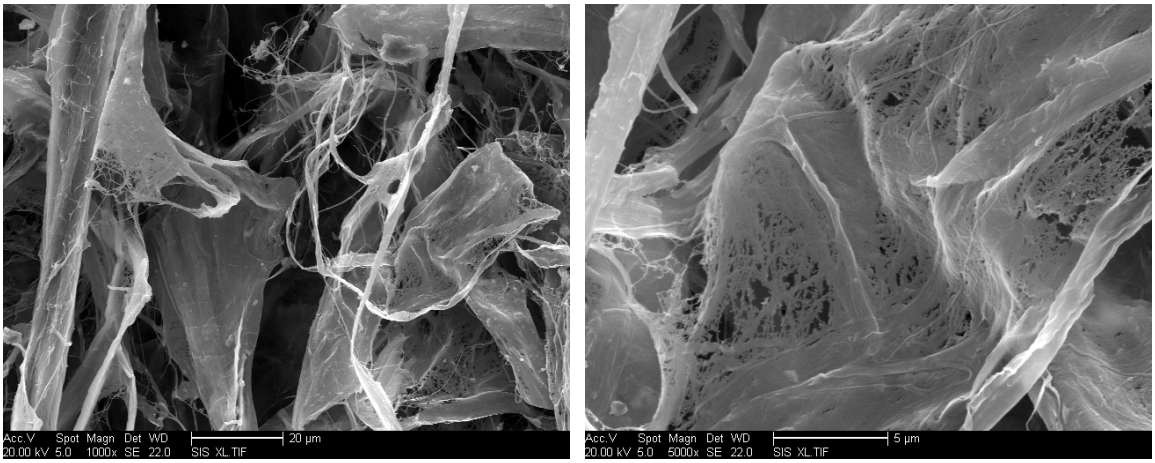

Fig. S8 SEM images showing large sheet-like aggregates in the aerogels obtained by freeze-drying the ~ 0.018% CNF content suspensions prepared by diluting the hydrogel-02.

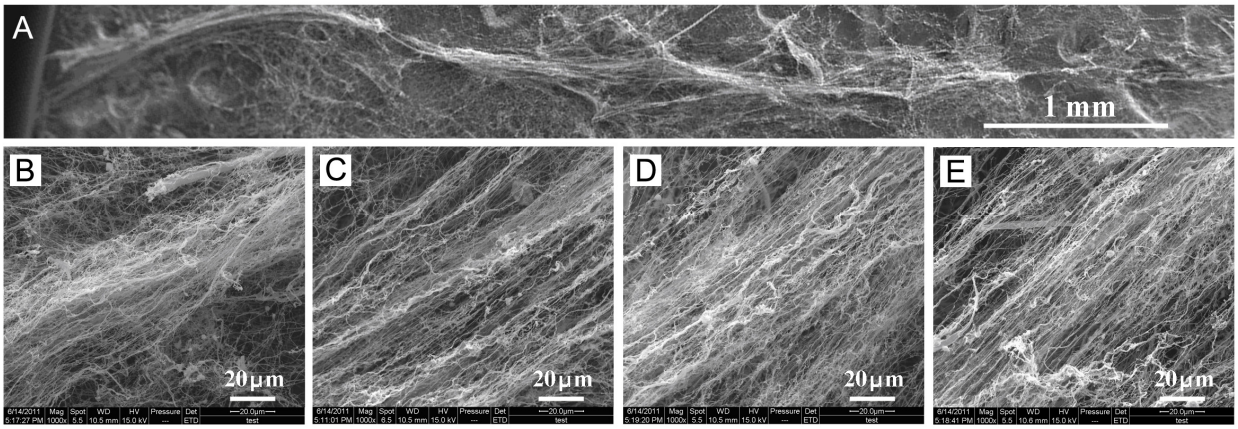

Fig. S9 SEM images of the ultralong cellulose nanofibers. (A) low-magnification SEM image showing that the length of the nanofibers is exceeding 6 mm. (B to E) SEM images taken from four different segments of the ultralong cellulose nanofibers in (A), showing the uniformity in width along the entire length.