Supplementary Information

Experimental methods

Preparation of cellulose/ILs solutions. A known weight of cellulose was added to a desired amount of ILs in a three-necked flask, and the mixture of cellulose/ILs was heated in oil bath for a certain time at the appointed temperature with mechanical stirring, yielding cellulose/ILs solutions with different concentrations. They were all clear and viscous solutions.

Preparation of TEM samples. A small drop of the cellulose/ILs solution was placed onto a copper TEM grid. Then excess amount of solution was removed with an aluminum foil. Finally, it was covered with a second copper disk. This sandwich samples were characterized by TEM immediately.

Measurement. All samples were examined using JEOL JEM-2200FS TEM operating at 200 kV accelerating voltage.

Figure S1

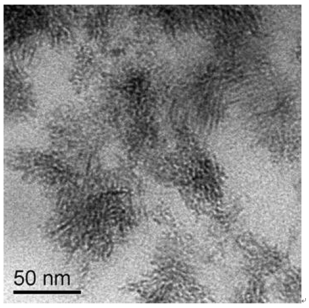

Fig. S1 TEM image of fresh 4 wt% MCC/AmimCl solution (60 °C, 1 h).

Figure S2

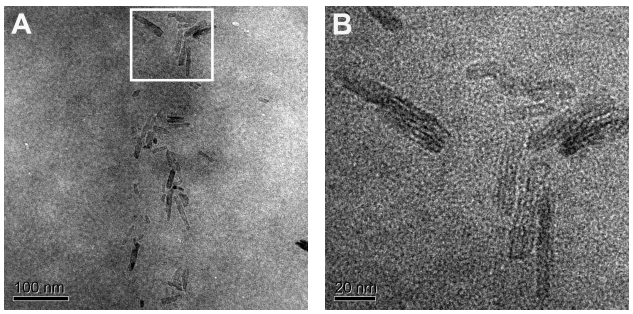

Fig. S2 (A) TEM image of fresh 1 % cotton/AmimCl solution (80 °C, 0.5 h); (B) magnification of selected region in (A).

Figure S3

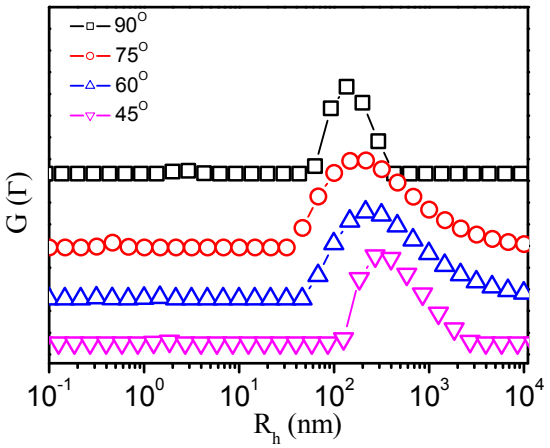

Fig. S3 The size distribution ($G(\Gamma)$) versus the apparent hydrodynamic radius (R_h) for 1 mg/mL cellulose/AmimCl solution at 50 °C.