**Supporting information for publication**

## 1. Solvents used in BC solubility study

Table S1. The complete range of solvents used in the bacterial cellulose solubility study.

| **Solvents tested** | **Surface Tension (mJ/m$^2$)** |
|---|---|
| Cyclo-hexylpyrolidone | 38.8 |
| Benzyl Alcohol | 39.0 |
| Ethanol Amine | 48.9 |
| Ethylene Glycol | 44.8 |
| N-dodecyl-pyrrolidone | 34.5 |
| N-octyl-pyrrolidone | 34.5 |
| N-ethyl-pyrrolidone | 36.9 |
| N-methyl-pyrrolidone | 40.1 |
| Water | 72.8 |
| Hexane | 18.4 |
| Methanol | 22.7 |
| Acetone | 25.2 |
| Dichloromethane | 26.5 |
| Dioxane | 33.0 |
| Tetrahydrofuran | 28.0 |
| Toluene | 28.5 |
| Benzonitrile | 34.7 |
| Benzaldehyde | 40.0 |
| Quinoline | 43.1 |
| Diiodomethane | 50.8 |
| Chloroform | 27.5 |
| Isopropanol | 23.0 |
| DMSO | 43.5 |

## 2. AFM statistics of diameter of BC nanofibrils prepared using a range of solvents

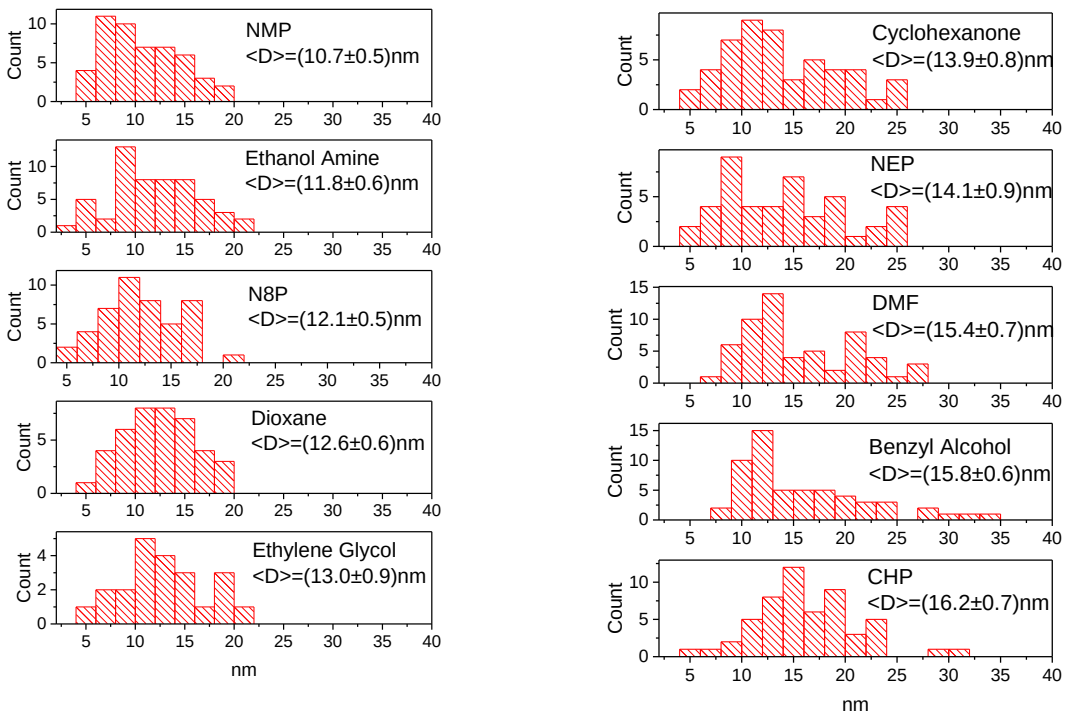


Figure S1. Height distributions of BC nano-fibrils from optimal solvents measured from AFM

## 3. Porosity and mechanical information of BC films

Table s2. Porosity and mechanical properties of BC films for each solvent

| Solvent | N | $\rho_{film}$ ($kg/m^3$) | Porosity, % (P) | Tensile strength (MPa) | Young's modulus (GPa) | Toughness ($MJ/m^3$) | Strain at break (%) |
|---|---|---|---|---|---|---|---|
| NMP (hot pressed) | 8 | 1084.62±113.32 | 28±3 | 156±20.4 | 2.29±0.74 | 9.05±2.50 | 10.53±1.9 |
| Ethanol amine | 7 | 929.91±48.44 | 38±2 | 78.9±14.5 | 0.96±0.29 | 5.76±1.54 | 12.18±1.67 |
| NMP | 7 | 909.28±87.42 | 39±4 | 114±12.5 | 1.37±0.28 | 8.05±1.32 | 13.0±1.40 |
| Cyclohexanone (hot pressed) | 9 | 836.67±102.00 | 44±5 | 62.9±8.75 | 1.1±0.35 | 2.10±1.37 | 7.39±1.49 |
| Ethylene Glycol | 7 | 831.72±74.24 | 45±4 | 80.3±18.7 | 0.84±0.30 | 5.25±2.22 | 12±2.5 |
| DMF | 7 | 810.50±36.40 | 46±2 | 48.7±10.5 | 0.96±0.25 | 2.55±1.12 | 8.35±2.05 |
| Dioxane | 7 | 570.04±52.09 | 62±6 | 29.3±6.46 | 0.465±0.13 | 2.09±0.62 | 9.71±1.81 |
| Cyclohexanone | 7 | 462.78±100.58 | 69±15 | 26.3±4.72 | 0.227±0.05 | 1.70±0.47 | 12±1.7 |