Electronic Supplementary Material (ESI) for Soft Matter.

Supplementary Information

Mechanical properties of cellulose aerogels and cryogels

Nela Buchtová[1], Christophe Pradille[2], Jean-Luc Bouvard[1], Tatiana Budtova[1]*

1 - MINES ParisTech, CEMEF - Centre de Mise en Forme des Matériaux, CNRS UMR 7635,

PSL Research University, CS 10207 rue Claude Daunesse, 06904 Sophia Antipolis, France

2 - Mat Xper, 19 Traverse du Barri, 06560, Sophia Antipolis, France

Corresponding author: Tatiana Budtova

E-mail: tatiana.budtova@mines-paristech.fr

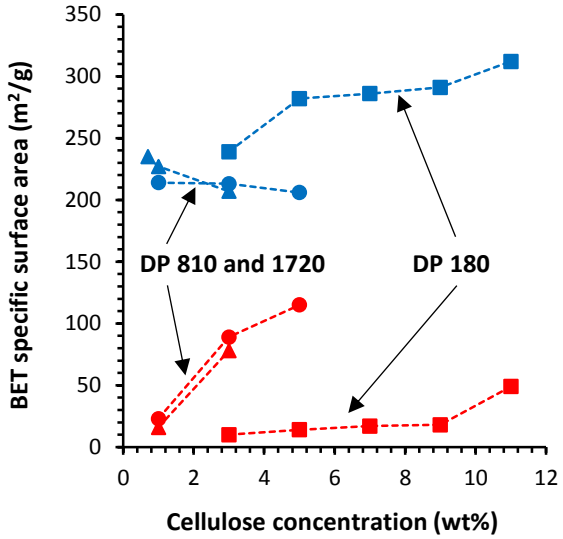

Figure S1: BET specific surface area of aerogels (in blue) and cryogels (in red) from cellulose of different molecular weight as a function of cellulose concentration. Dashed lines are given to guide the eye.

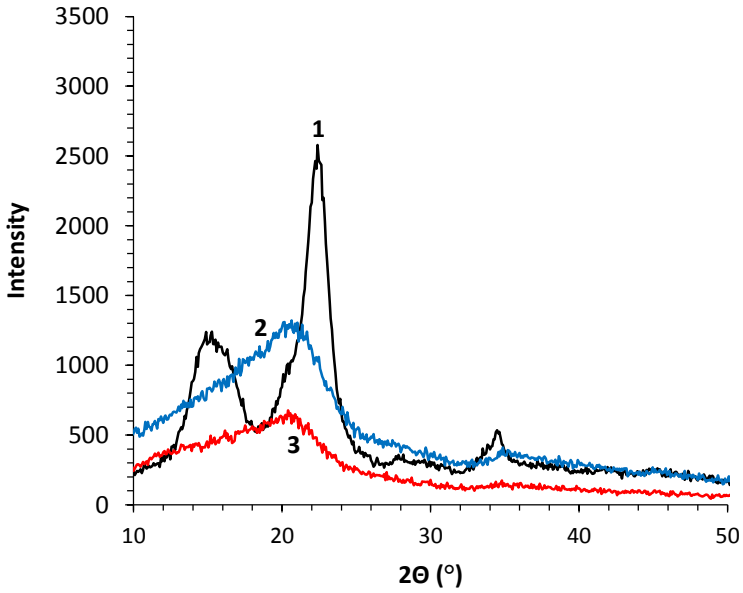

Figure S2: X-rays diffraction patterns of neat microcrystalline cellulose of DP 180 (1), aerogel based on 9 wt% of cellulose DP 180 (2) and cryogel based on 3 wt% of cellulose DP 180 (3).

Table S1: Summary of the results on the mechanical properties of cellulose aerogels obtained via dissolution-coagulation route (data from literature and the present work). Literature data were analyzed by plotting and approximating compressive modulus (E) *vs.* bulk density (ρ) with power law dependence.

Cellulose DP	Solvent	Non-solvent	Bulk density interval (g/cm^3)	Exponent n in $E \sim \rho^n$ dependence	Comment	Reference
Cotton, DP not reported	1-allyl-3-methylimidazolium chloride ([Amim][Cl])	Water and water/[Amim][Cl] mixture	0.024 – 0.03	2.15		52
DP 211	$Ca(SCN)_2 \cdot 6H_2O$	Ethanol	0.04 – 0.014	1.67		53
DP 211	$Ca(SCN)_2 \cdot 6H_2O$	Ethanol	0.03 – 0.1	1.51	Authors report linear dependence	21
DP 211	ZnCl	Isopropanol	0.09 – 0.26	2.94	Authors report aerogels composed of cellulose I and linear dependence of modulus *vs.* density	21
DP 211	ZnCl	Isopropanol	0.09 – 0.26	2.55		22
DP 211	ZnCl	Water	0.08 – 0.25	4.69		22
DP 180	[Emim][OAc]	Water	0.06 – 0.22	3.38		13
Eucalyptus prehydrolysis kraft dissolving pulp, DP 1013	1,1,3,3-tetramethylguanidinium acetate [TMGH][OAc]	Ethanol	0.015 – 0.08	2.69	Crystallinity 72%, axially anisotropic	14
DP 180, 810 and 1720	[Emim][OAc]/DMSO	Ethanol	0.06 – 0.22	4.20	Amorphous	This work