

Supporting Information for:

The sol-gel transition of ultra-low solid content TEMPO-cellulose nanofibril/mixed-linkage β -glucan bionanocomposite gels

Suvi Arola¹, Mahmoud Ansari², Antti Oksanen³, Elias Retulainen³, Savvas Hatzikiriakos²,
and Harry Brumer^{1,4,5,6,*}

¹Michael Smith Laboratories, University of British Columbia, 2185 East Mall, Vancouver, BC, V6T 1Z4, Canada.

²Department of Chemical and Biological Engineering, University of British Columbia, 2360 East Mall, Vancouver, British Columbia, Canada

³VTT Technical Research Centre of Finland, Ltd., P.O. Box 1603, 40101 Jyväskylä, Finland

⁴Department of Chemistry, University of British Columbia, 2036 Main Mall, Vancouver, British Columbia V6T 1Z1, Canada.

⁵Department of Biochemistry and Molecular Biology, University of British Columbia, 2350 Health Sciences Mall, Vancouver, British Columbia V6T 1Z3, Canada.

⁶Department of Botany, University of British Columbia, 6270 University Blvd., Vancouver, British Columbia V6T 1Z4, Canada

*To whom correspondence should be addressed: E_mail brumer@msl.ubc.ca; Tel. (+1) 6048273738; Fax (+1) 6048222114.

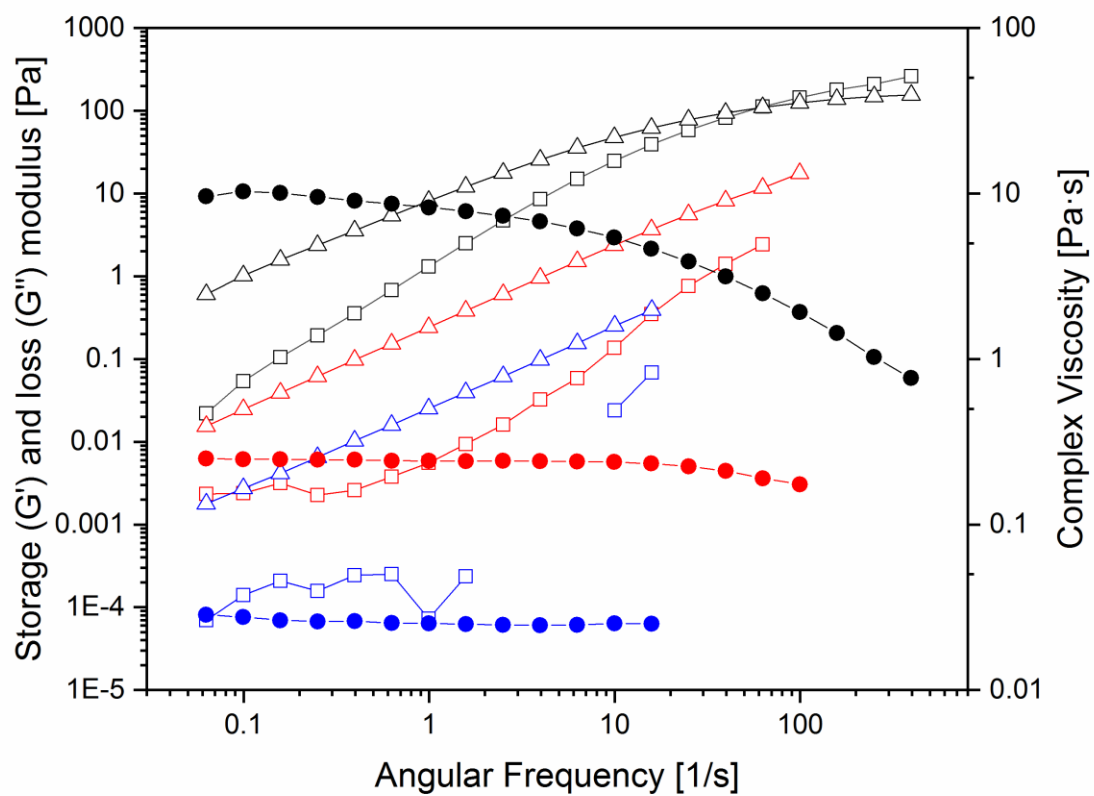


Figure S1. Modulus of neat MLG. Black symbols 20 g L⁻¹ MLG, red symbols 10 g L⁻¹ MLG, and blue symbols 5 g L⁻¹ MLG. Squares G', triangles G'', and circles complex viscosity.

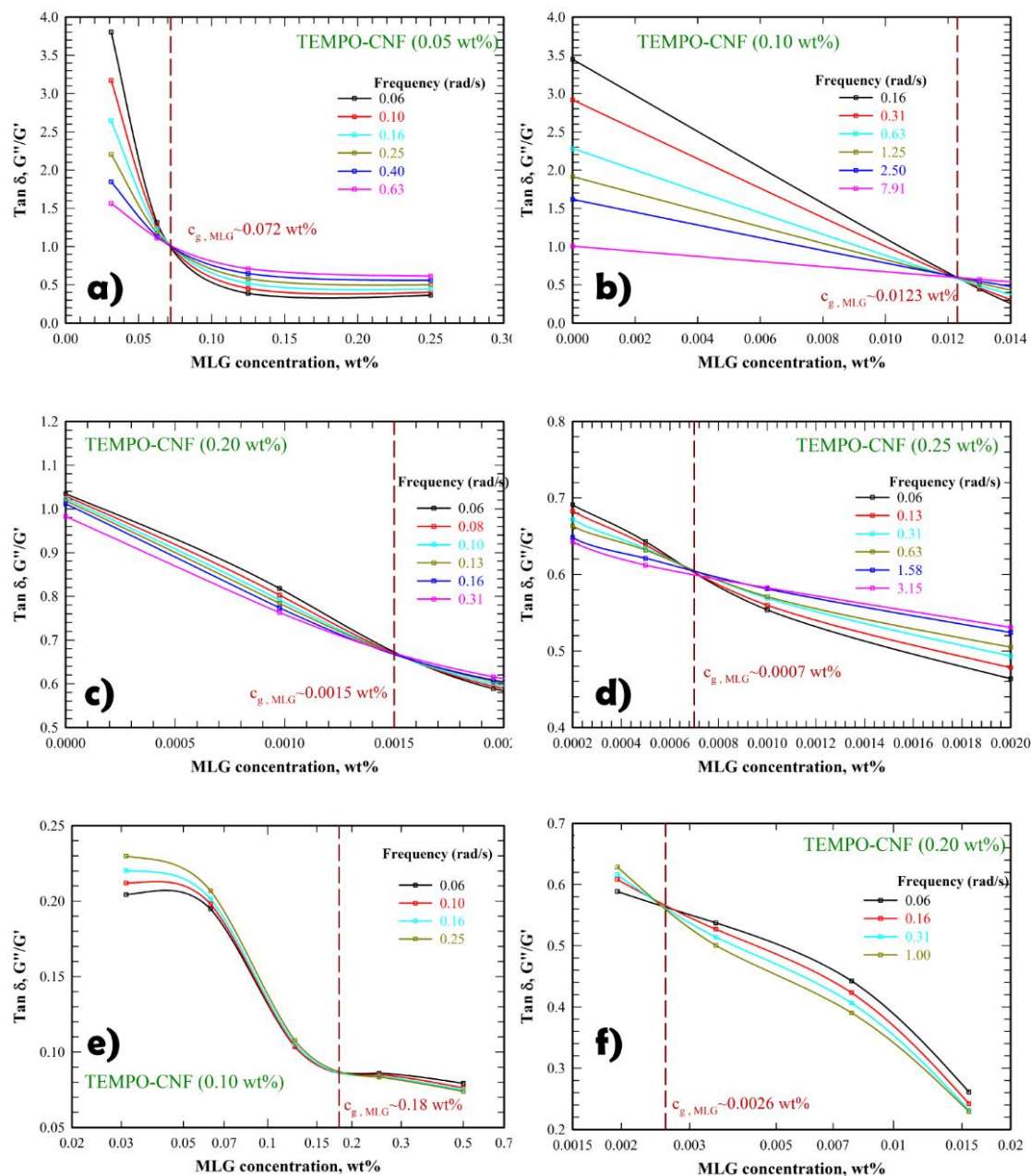


Figure S2. Sol-gel transitions for TEMPO-CNF/MLG systems as a function of MLG concentration (cf. Table 1). a) first transition with 0.05 % (w/v) TEMPO-CNF, b) first transition with 0.10 % (w/v) TEMPO-CNF, c) first transition with 0.20 % (w/v) TEMPO-CNF, d) first transition with 0.25 % (w/v) TEMPO-CNF, e) second transition with 0.10 % (w/v) TEMPO-CNF, and f) second transition with 0.20 % (w/v) TEMPO-CNF. Data for 0.15 % (w/v) TEMPO-CNF is shown in Figure 3. Lines between data points were generated by using spline interpolation in MATLAB.

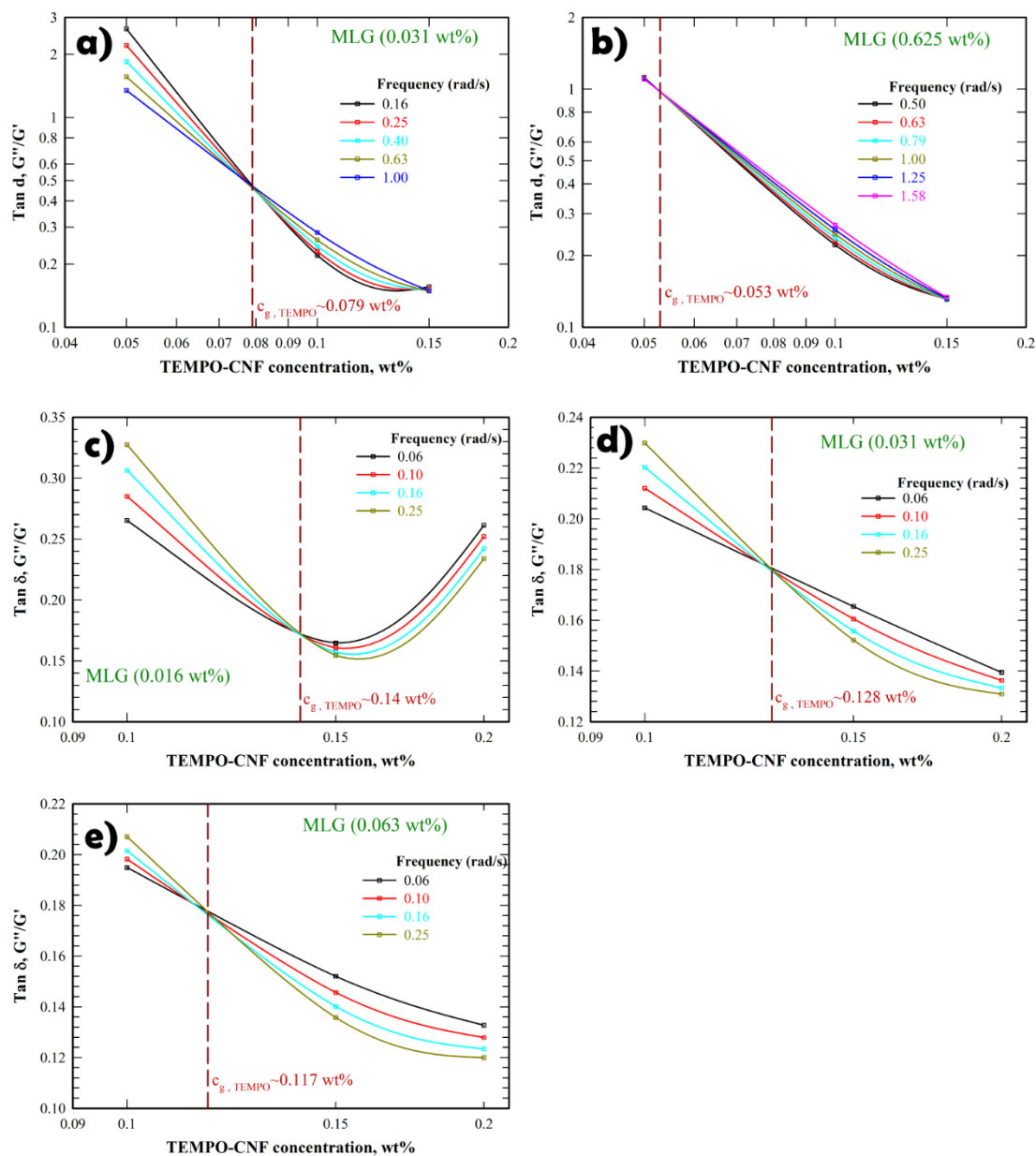


Figure S3. Sol-gel transitions for MLG/TEMPO-CNF systems as a function of TEMPO-CNF concentration (cf. Table 1). a) first transition with 0.031 % (w/v) MLG, b) first transition with 0.625 % (w/v) MLG, c) second transition with 0.016 % (w/v) MLG, d) second transition with 0.031 % (w/v) MLG, and e) second transition with 0.063 % (w/v) MLG. Data for 0.125 % (w/v) MLG is shown in Figure 4. Lines between data points were generated by using spline interpolation in MATLAB.

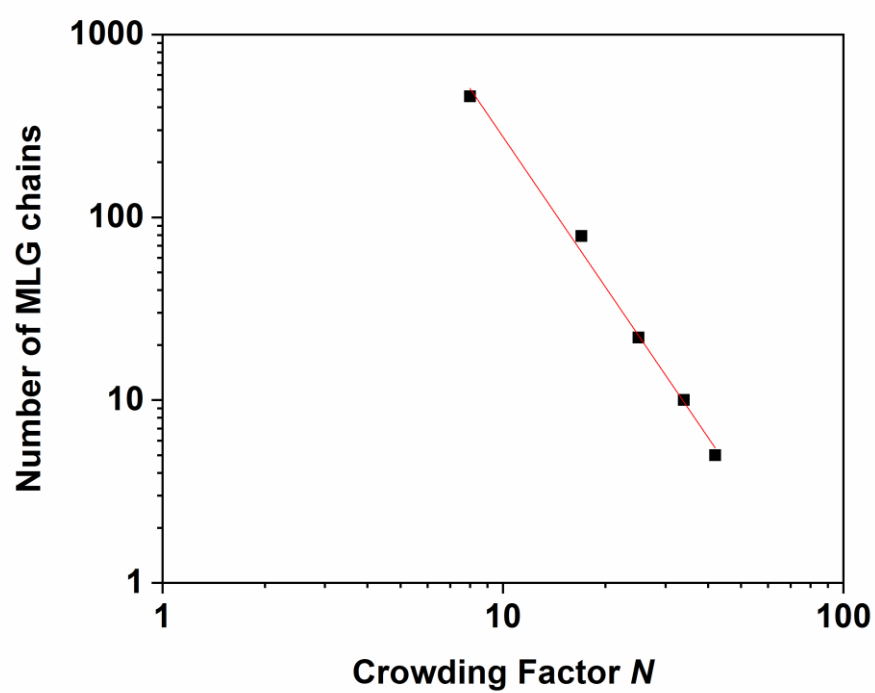


Figure S4. *Scaling of crowding factor, N , with the number of MLG chains. The slope of the linear fit is -2.73.*