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Supplementary Material

Polymer-decorated cellulose nanocrystals as environmentally friendly additives for olefin-based drilling fluids

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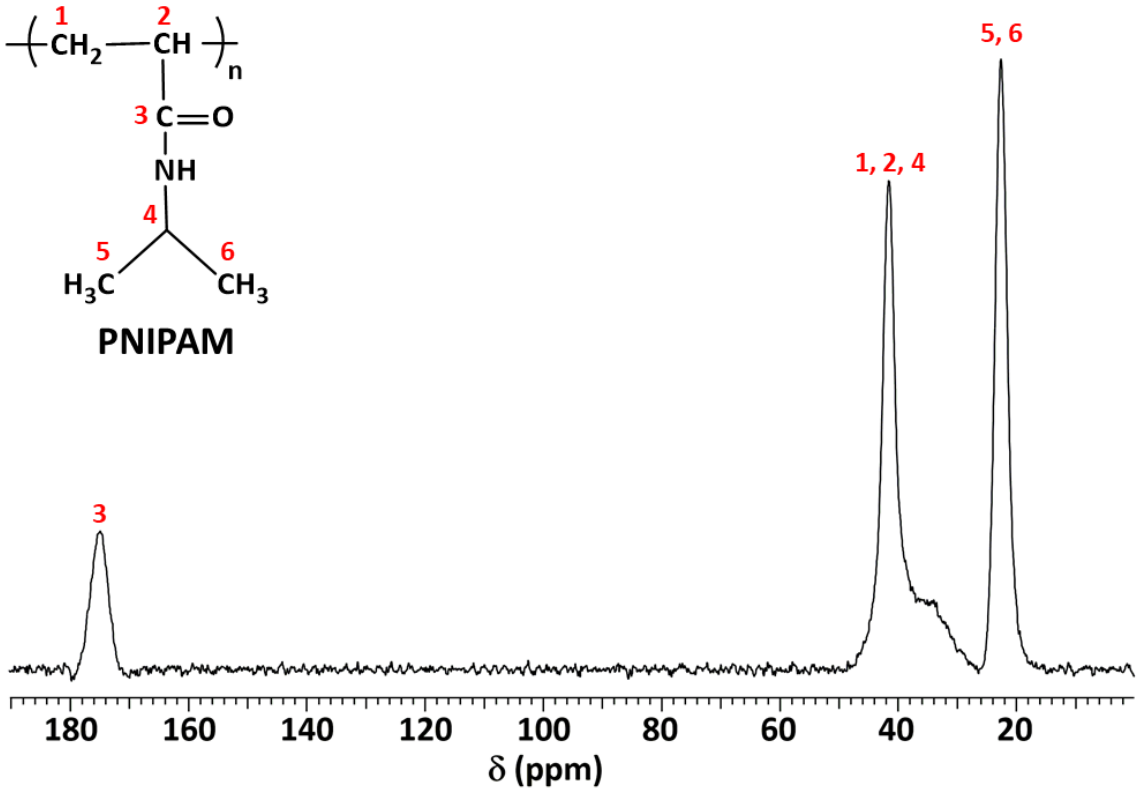


Figure S1. ^{13}C NMR spectrum of PNIPAM.

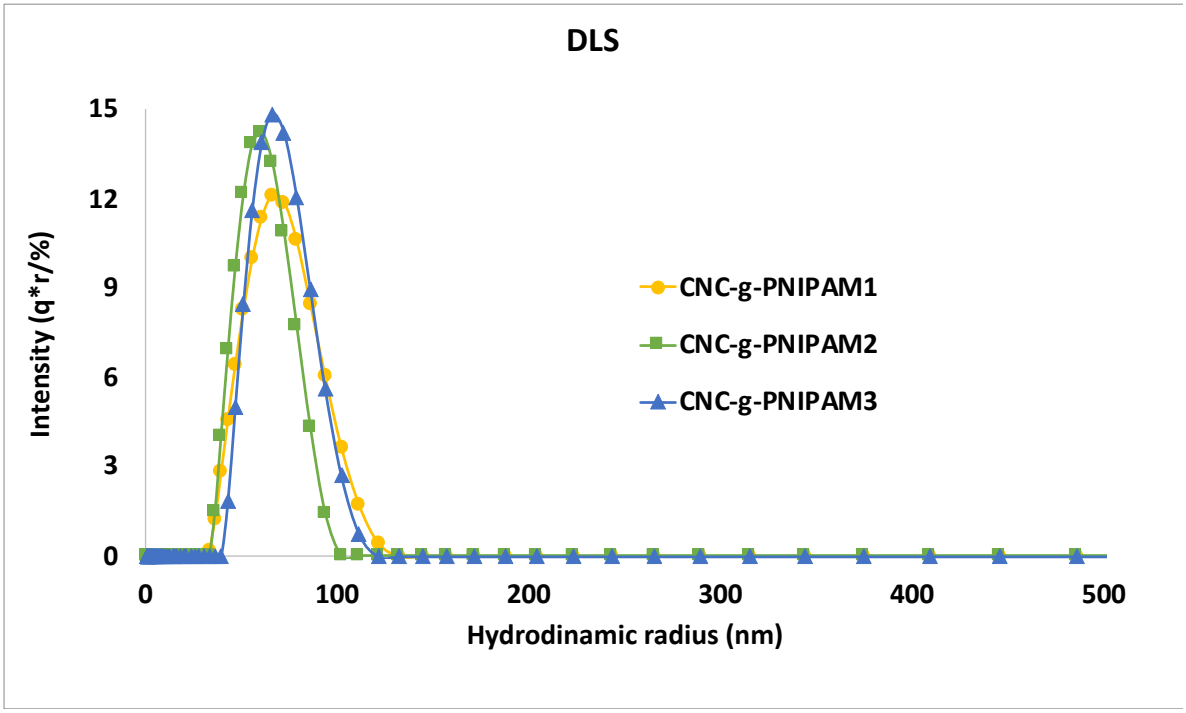
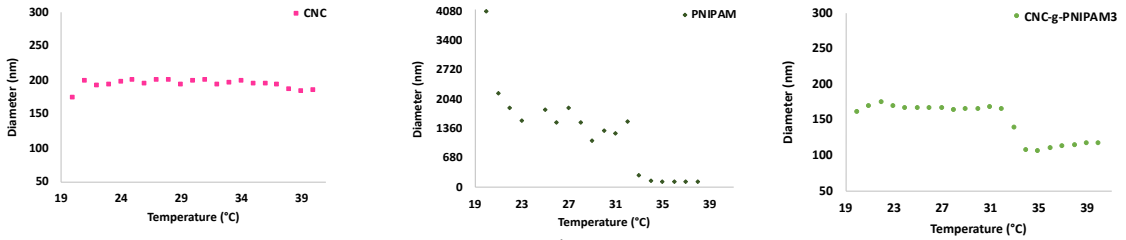


Figure S2. Hydrodynamic radius of the CNC-*g*-PNIPAM1, CNC-*g*-PNIPAM2 and CNC-*g*-PNIPAM3 copolymers in water after filtration with 0.45 μm pore size cellulose acetate Millipore membranes.



(**a**) (**b**) (c)

Figure S3. Hydrodynamic diameter of (**a**) CNC, (**b**) PNIPAM and (**c**) CNC-*g*-PNIPAM3 as a function of temperature, without filtration. As expected, CNC did not exhibit a thermosensitive behavior in water and the transmittance remained constant throughout the heating process. PNIPAM exhibited a large mean size, probably due to intermolecular associations, which abruptly decreases with heating, due to breakage of polymer-water and polymer-polymer intermolecular hydrogen bonds and increase of polymer-polymer intramolecular interactions when temperature reaches 32 ℃. CNC-*g*-PNIPAM3 presented a much smaller size when compared to PNIPAM, but the thermosensitive behavior can still be observed by heating, as they exhibited a smaller size with the increase in temperature from 33 ℃, due to the contraction of the PNIPAM chains decorating the cellulose nanocrystals.