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Electronic Supplementary Information for

Surface Grafting of Thermoresponsive Microgel Nanoparticles

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Temperature control of wetting of the wire

Studying the wire wettability, we have run two different sets of experiments. In the first set of experiments, the modified tungsten wire was placed into a thermo-insulated box with controllable humidity and temperature. Two alligator clips connected to the power supply were attached to the wire ends thus closing the circuit. The temperature was controlled by adjusting the voltage so that different current generated different amount of the Joule heat. The droplet was deposited on the testing wire using another 100 μm diameter tungsten wire.. The delivery wire, droplet, and modified tungsten wire altogether were maintained at the same temperature. In order to confirm that the heat exchange played no role in the contact-angle analysis, one can make the following estimates. The time of heat exchange between the drop and the wire in question is estimated as $\tau = \rho c_p R^2 / k$, where ρ is the water density, c_p is the specific heat, k is the thermoconductivity, and R is the droplet radius. Taking $R \sim$ 150 μm, and $k/(\rho c_p) = 1.4 \cdot 10^{-7}$ m²/s, we obtain $\tau \sim$ 0.2 s, which is much smaller than the time of observation of the change of contact angle.

   To make additional measurements of the contact angle, we conducted another experiment. The grafted wire was attached to a linear positioning stage (VT-21, MICOS USA) and gently dipped and held in the container with deionized water. The temperature of the water was controlled by a K-type thermocouple (30 gauge) connected to data logger/thermometer (HH506RA) by OMEGA Engineering Inc. The schematic of the experiment is shown in Figure S1. The setup consists of a water pump, which aids in the circulation of water through the jacket of water circulating bath (1130A PolyScience) while also controlling the temperature. the The shape of the meniscus was captured by a camera (Dalsa Falcon 1.4) . To avoid any diffraction caused by the edge of the water jacketed condenser, it was slightly overfilled with water.
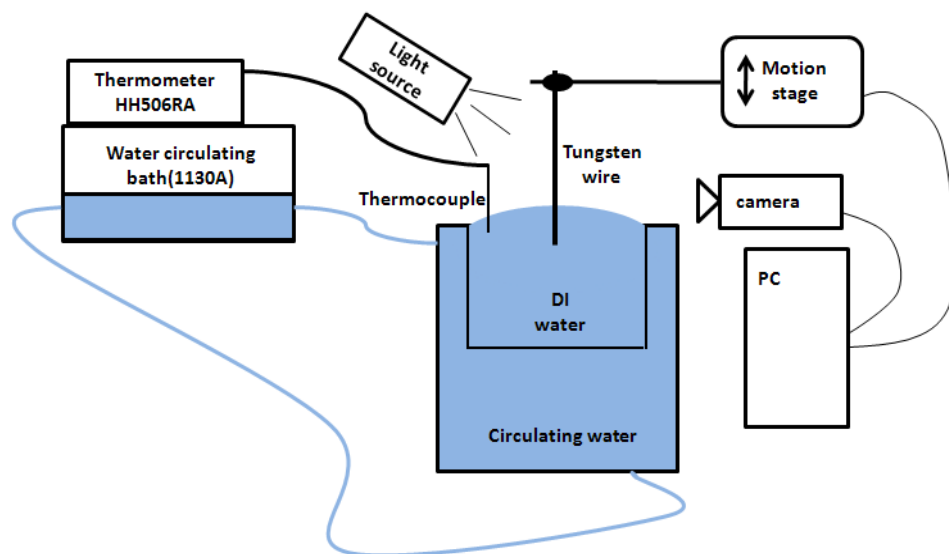
Figure S1. Schematic of the experimental setup for analysis of the change of meniscus shape with temperature.