particles were subsequently coated with a copolymer of ethyl acrylate and 10% wt of allyl methacrylate as an interlayer for grafting of the shell polymer. Finally a shell of polyethylacrylate was synthesized. To reduce the stickiness and enhance the toughness of the polymer, the glass transition temperature of the shell polymer was increased to −1°C by copolymerization of the ethyl acrylate with 3% wt hydroxyethyl methacrylate, 25% wt iso-butyl methacrylate and 0.2% wt of diallyl phthalate. The ratio of core: interlayer: shell was 33: 10: 57 by wt.

A.2 Microscopy

Fibers were cross-sectioned for microscopy by carefully placing samples in molten dental wax and then setting to hardness by cooling with liquid nitrogen. Thin microtomes of the sample were then removed with a micro-positioned glass knife-edge, at room temperature, until a suitably clean cross-section of the film was visible at the surface of the wax. All the microscopic images displayed were then taken with an Olympus BX51 light microscope.

A.3 Spectroscopy

All spectroscopic measurements reported were taken with an adapted Olympus BX51 microscope, using a focused spot diameter of approximately 2 μm (at ×20 magnification), with the light signal collected using suitable focusing optics and a fiber-coupled CCD spectrometer. The spectra were standardized using a diffusive white-light scatterer (for dark-field reflectance).

A.4 Stretching experiments

The effect of stretching on the color of the fibers was studied by taking spectra from the surface of the fibers at different measured strains (e, where $e = 100\% \times \Delta l/l$, or % increase in length). Pieces of length ~10cm, equal to the circumference of a glass vial, were coiled around the vial and securely taped down. The circumference of the vial was systematically marked with 10% strain factor steps. The fibers were stretched until the ordering of particles was completely lost or the fiber broke. The vial was positioned carefully under the BX51 microscope, with the radial direction of the fiber always being normal to the focal plane of the objective, and the same protocols for spectroscopy were used as described above.

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