

In-situ synthesis of dynamically color-tunable and reversible microfiber in microfluidics

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We design a system for production of mechanochromic microfiber in a continuous manner. To produce color-tunable microfiber with in-situ, we select a microfluidic system as a best candidate that is possible to synthesize highly uniform and size-controllable microfiber. The system is designed to make elongation flow by injecting sheath carrier fluid through flow-focusing channel which is long enough to stabilize. Low interfacial tension between carrier fluid and dispersed phase causes stable and continuous flow of jet stream. At the downstream, the jet is continuously exposed to UV at exit of the microfluidic channel for photopolymerization. The resultant microfiber exhibits high stretchability than previous reported mechanochromic microfiber and reversible color-tunability. Moreover, this system has the potential to fabricate Janus microfiber which exhibits two color domains, and it is expected to create more various color combinations by using this system than the single-color microfiber synthesis systems.