Energy Storage in New Form Factors Enabled by a Thermally Drawn Multimaterial Fiber

이정태†
경희대학교
(jungtae@khu.ac.kr†)

The ubiquity of wearables, together with the growing demand for power, presents a unique opportunity for fiber-based mobile energy storage systems. Supercapacitor fibers which have short charging times, long cycle lifespans, and high-power densities, appear to be suited for powering non-flat electronic devices. The key issue of fiber-shaped supercapacitors is the length which needs to be comparable to traditional long-length textile fibers for scalable machine weavability or as a filament for 3D printing. Longer lengths also allow for the upwards scaling of energies equivalent to conventional energy storage systems. However, no system has yet been able to achieve this goal. In this talk, I will discuss a new strategy to realize a supercapacitor in a system level fiber, thereby enabling extended length, high-performance, flexible, printable, machine washable and weavable energy storage fibers. This new route used for generating these fibers leverages a preform-to-fiber thermal drawing process in which the supercapacitor architecture and materials are embedded into a preform at macroscale and drawn into arbitrary lengths of microstructured multimaterial supercapacitor fiber.