Research and education on fiber-based materials for nanofluidics at Clemson University

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Advanced materials and the science and engineering related to their design, process, test and manufacture represents one of the fast growing sectors of the Materials Science and Engineering field. Awareness of existing process, performance, manufacturing or recycle-ability issues and limitations, often dictates the next generation of advances needed to improve existing or create new materials. To compete in this growing science and technology area, trained experts must possess strong academic skills in their discipline as well as advanced communication, networking and cultural teamwork experience. Clemson's School of Materials Science and Engineering (MSE), is continuing to expand our program to focus on unique capabilities which support local, regional and national needs in advanced materials. Specifically, MSE at Clemson is evolving to highlight intrinsic strengths in research and education areas related to optical materials, advanced fibers and composites (based on inorganic, organic and natural fibers), biomaterials and devices, and architectural and restoration material science (including the conservation and preservation of maritime structures). Additionally, we continue to invest in our expertise in materials design and fabrication, which has historically supported our well known programs in ceramics and textiles. In addition to a brief review of the School's forward-looking challenges to remain competitive among strong southeast regional materials science programs, this presentation will also highlight recent technical advances in fiber-based materials for nanofluidic applications. Specifically we will present recent results on design of fiber-based nanofluidics for sensor applications and we will discuss some physical phenomena associated with liquid transport at nanoscale.