

Soft-Templating Approach to Synthesize Mesoporous Vanadium Pentoxide for Enhanced Electrochromism by using Electrohydrodynamic Jet Printing

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Mesoporous interconnected inorganic nanostructure has the advantage of ion intercalation process because of their high surface-to-volume ratio and short ion diffusion distance due to their structural characteristics. The fabrication of such nanostructures is an effective strategy to improve the performance of electrochromic device, super capacitors, and batteries. Here we demonstrate the mesoporous vanadium pentoxide through a soft-templating approach using the amphiphilic diblock copolymer polystyrene-block-poly(ethylene oxide) (PS-*b*-PEO) as a structure-directing agent. The obtained mesoporous vanadium pentoxide has a foam-like morphology with high surface area and porosity, which is expected to improve electrochromic performance. Also, since this process is solution processable, it is expected to be applicable to various printing (e.g., slot die, ink jet, and electrohydrodynamic jet printing) for large area and patterning fabrication.