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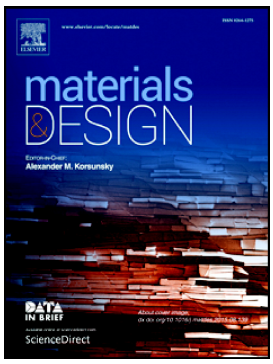

High surface area flexible zeolite fibers based on a core-shell structure by a polymer surface wet etching process

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High surface area flexible zeolite fibers based on a core-shell structure by a polymer surface wet etching process

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Abstract

Flexible zeolite fibers based on a core-shell fiber structure were prepared by an electrospinning method, and then the surface of the as-spun fiber was partially etched by a wet etching process. Zeolite porous ceramic particles were embedded in the core-shell fiber structure of poly(vinylidene fluoride)(PVDF)/polyvinylpyrrolidone(PVP), and the adsorption sites of the zeolite began to be exposed by partially wet etching of the hydrophilic PVP polymer in the shell parts. The specific surface area increased significantly by exposing the adsorption sites of the zeolite on the surface, and at the same time, flexibility and strength were maintained by the existing hydrophobic PVDF polymer acting as a skeleton. The morphology of the partially etched surface of the flexible zeolite fibers was observed by field-emission scanning electron microscopy (FE-SEM) and atomic force microscope (AFM), and the specific surface area was measured by N_2 adsorption/desorption isotherm. The improved adsorption/desorption characteristics of the flexible zeolite fiber filters were observed by gas chromatography (GC).