

A study on flexible zeolite nanofiber composites with a high surface area

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Flexible zeolite nanofiber composites of Y-zeolite(CBV 760) and polyvinyl-pyrrolidone (PVP) were synthesized by electrospinning method. After electrospinning, the specific surface area of Y-zeolite/PVP nanofibers were improved by polymer surface thermal etching process. Based on the TGA analysis result, the surface thermal etching temperature range of 250°C~400°C were confirmed as the appropriate temperature range of zeolite nanofibers for maintaining flexibility. The XRD results indicated that the phase change did not occur in the zeolite nanofibers by a thermal etching process. FE-SEM and AFM images clearly showed that the polymer surface of the nanofibers was partially etched, and zeolite particles were exposed on the surface of the nanofibers. Although the specific surface area of the as-spun zeolite nanofibers without thermal etching was 210 m²/g, the thermal surface etched zeolite nanofiber at 400 °C had a specific surface area of 816 m²/g. Based on the surface partial etching process, active sites of zeolite were exposed on the surface of the nanofibers, and it was possible to produce a flexible zeolite nanofiber with a high specific surface area.