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Preparation and Characterization of Electrospun Alumina Nanofibers MARIE J. PINTI, STEPHEN N. TACASTACAS, NENAD STOJILOVIC, Department of Physics, John Carroll University, JOHN P. O'BRIEN, ANNA PISCHERA, MATTHEW P. ESPE, Department of Chemistry, Knight Chemical Laboratories, The University of Akron — Alumina nanofibers are promising materials for use in high- temperature applications since they are chemically inert up to very high temperatures. Applications include use as catalyst support in high-temperature chemical reactions, fire protection materials, and as a high-temperature insulator. Electrospinning is a relatively simple and inexpensive method for obtaining nanometer-size fibers and has become a popular technique for producing metal-oxide nanofibers in recent years. The electrospinning mixture for the production of alumina nanofibers typically contains aluminum acetate stabilized with boric acid as the alumina precursor; but the observed presence of boron and sodium on the surface of these nanofibers may affect their use as catalytic supports. We have produced alumina nanofibers from an aluminum reagent devoid of the boric acid stabilizer and calcined the fibers at different temperatures to produce nanofibers with different phases of alumina. Characterization of the fibers by TGA, FE-SEM equipped with the XEDS, powder XRD, DRIFTS, and SSNMR methods to determine the fate of the precursors, fiber morphology and the composition and structure of the calcined alumina nanofibers.

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