



Alumina Nanofibers by Electrospinning

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The fabrication of dense alumina fibers at low cost by sol-gel and electrospinning, using aluminum nitrate as precursor is reported. Polyvinyl pyrrolidone was used as spinning polymer, while Pluronic 127 was used as additive to achieve a porous structure. The material was characterized at different stages of thermal treatment by SEM, EDS, FTIR, XRD, and thermal analyses. It was observed that the increase in precursor ratio is related to the formation of more stable fibers that retain their morphology after sintering at 1600°C. The fibers obtained from a solution with high mole ratio presented a mean diameter close to nanometric scale 153 ± 39 nm. FTIR and XRD demonstrated that amorphous, γ -, and δ -Al₂O₃ polymorphs were present in fibers treated at 800°C, while α -Al₂O₃ was formed in samples at approximately 1000°C. EDS and XRD study demonstrated the high purity and crystalline form of the alumina fibers.