

## Nanofiber technology from the electrospinning

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The nanofiber is produced by the electro spinning process, and it is widely utilized in medical filters, electronic materials, etc.. Moreover, the production of the manufacturing electro spinning machines of the solution-spun type started also in Japan. In this paper, the challenge of Japan for application and mass production of the nanofiber noticed at present is explained. Figure is SEM image of a fiber in each viscosity. The distance of tip-to-collector is 10cm and voltage is 10kV. Viscosity of the sol is 455 MPa. At 246MPa the fiber cannot be produced and polymer solution turns into a gel directly. At 455MPa and the above fibers can be produced. 455MPa is the thinnest fiber, 1.14 $\mu$ m. 625MPa is 3.17 $\mu$ m and 980MPa is 3.26 $\mu$ m. As a result, we can produce the thinnest fiber under the condition that distance of tip-to-collector is 10cm, voltage is 10kV and viscosity is about 500MPa. We burned the fiber for 2h at 600°C to get the inorganic fiber. Because we know that it is not decomposed at 600°C, we decided on the temperature from the result. There is no change for the thinnest of the fiber. The creation of the nanofiber that used the electro-spinning process and the examination to the mass production were done. In addition, we examined the possibility of the melt-spinning method of the nanofiber for PP and PE polymer. It has been understood that productivity is low though the nozzle method of the electro-spinning can obtain a stable nanofiber nonwoven. Though metal nozzles are necessary for the manufacturing equipment, the resin nozzle of the disposable type is suitable, when the cleaning of the nozzle by solution exchange and nozzle blockage is considered in test machine of the continuous production. We also produced multi- nozzle with 10 nozzles in the 1cm interval experimentally.