>>> ANNOUNCEMENT

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High Speed Production System of Nanofibers and their Applications

ABSTRACT

The most common recognition to nanotechnology is "the technology which produces the novel function and the more excellent characteristics by operating and controlling the atom and molecule in the scale from 1nm to 100nm to change the structure and arrangement of a substance". According to the recognition "Nanofiber" is defined as the fiber-like substance whose diameter is 1nm to 100nm or 1000nm, and length is more than 100 times of a diameter. There are various manufacturing processes for nanofiber production, which are shown as nanospinnings, CVD for carbon nanotubes, self-organization for natural nanofibers such as collagen nanofibers, and the processes for nanowires. Among those manufacturing processes cited above the nanospinnings, such as electrospinning, the conjugate spinning and meltblown, are the most attractive technologies which are realizing the practical utilization. Especially, electrospinning is one of the fascinating procedures to produce nanofibers.

The productivity of normal electrospinning is very low because the fluid flow rate from a nozzle is about 2 very difficult to apply the nanofibers in industrial scale. Recently, we have developed two high speed nanofiber production systems, which are applied to polymer solution and polymer melt, respectively. The former one is called as “Blow Electrospinng(BES)” and the flow rate of polymer solution from a nozzle is about 2ml/min to produce nonwoven fabrics, and the latter one is called as “Melt Air Spinning(MAS)” and that of molten polymer is about 15ml/min to produce raw cotton-like, which was developed during the BES development. The former one is available for all kind of solvent soluble polymer and the latter one for molten polymer. The development of high speed production systems of nanofibers expand their potential applications, which are oil-water separation, membrane distillation, water retaining in soil, air purification, acoustic insulation, protection against cold, battery separator and so on.

BIO

2014	Professor at the Institute of Carbon Science and Technology, Shinshu University, Nagano, Japan
2012/04	Emeritus and Appointed Professor, Tokyo Institute of Technology, Tokyo, Japan
2011-	Project Sub-leader “Green Sensor Network Project”, New Energy and Industrial Technology Development Organization (NEDO), Tokyo Institute of Technology, Tokyo, Japan
2010-	Project Sub-leader “Megaton Water System”, First Program of Cabinet Office, Government of Japan
2006-2010	Project Leader “Basic Technology Development for Fiber Materials Having Advanced Functions and New Structures” (NEDO), Tokyo Institute of Technology, Tokyo, Japan
1999-	Professor, Dept. of Organic and Polymeric Materials, Tokyo Institute of Technology, Tokyo, Japan
1988-	Associate Professor of Organic and Polymeric Materials, Tokyo Institute of Technology, Tokyo, Japan
1981-82	Guest Scientist, Max-Planck-Institute for Biophysics, Frankfurt, Germany
1975-	Assistant Professor of Organic and Polymeric Materials, Tokyo Institute of Technology, Tokyo, Japan
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November 28, 2014 at 10 am

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