

Electrospinning of nanofibres: from introduction to applications

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Electrospinning is a versatile and efficient technique to produce continuous nanofibres, from submicron down to nanometers diameters by using a high potential electric field [1]. The process has gained great scientific and industrial interest due to its versatility, cost-efficiency, easy industrial scale up and potential to be used in a wide range of applications.

Indeed, electrospinning is applicable to a wide range of materials such as synthetic and natural polymers, metals, as well as ceramics and hybrid systems. Moreover, electrospun nonwoven mats, due to their high specific surface, high porosity, high fibre interconnectivity are good candidates for many applications, which extend to filtration, tissue engineering, wound dressings, drug delivery, cosmetics, energy conversion and storage, catalysts and enzyme carriers, protective clothing, sensors, electronic and semi-conductive materials.

The present talk on electrospinning gives some information on history of electrospinning, process theory and basic principles, parameters that influences the process and fibres morphology, as well as on applications of electrospun nanofibres.

Finally the new electrospinning apparatus installed here in ISOF will be presented, as well as some preliminary results obtained with the electrospinning of wool keratin solutions [2].

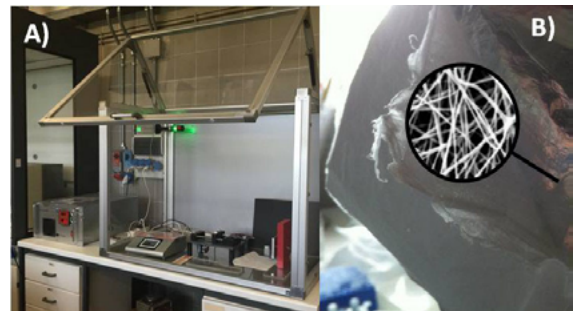


Fig. 1. A) Electrospinning plant at ISOF; B) Keratin nanofibrous membrane.

[1] Z.M. Huang, Y.Z. Zhang, M. Kotaki and S. Ramakrishna, *Compos. Sci. Technol.*, 2003, 63, 2223.

[2] A. Aluigi, A. Corbellini, F. Rombaldoni, M. Zoccola, M. Canetti, *Int. J. Bio. Macromol.*, 2013, 57, 30.

Tuesday 11 October 2016, 14:30

ISOF 12 – Meeting Room (1st floor)

CNR Research Area

Via Gobetti 101, Bologna