

Low temperature sputtered TiO₂ nano-sheaths on electrospun PES fibers for high porosity photoactive materials

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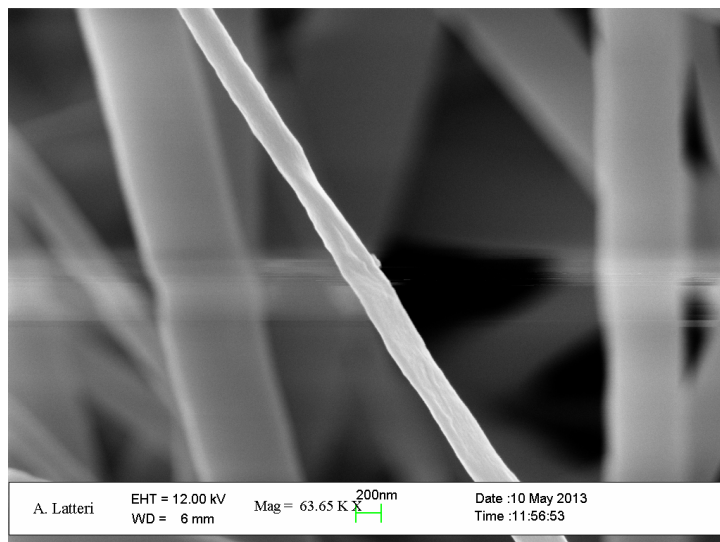
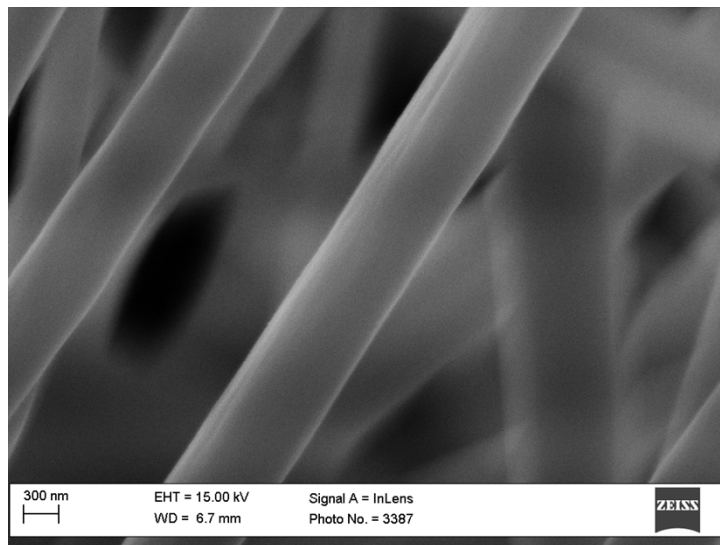
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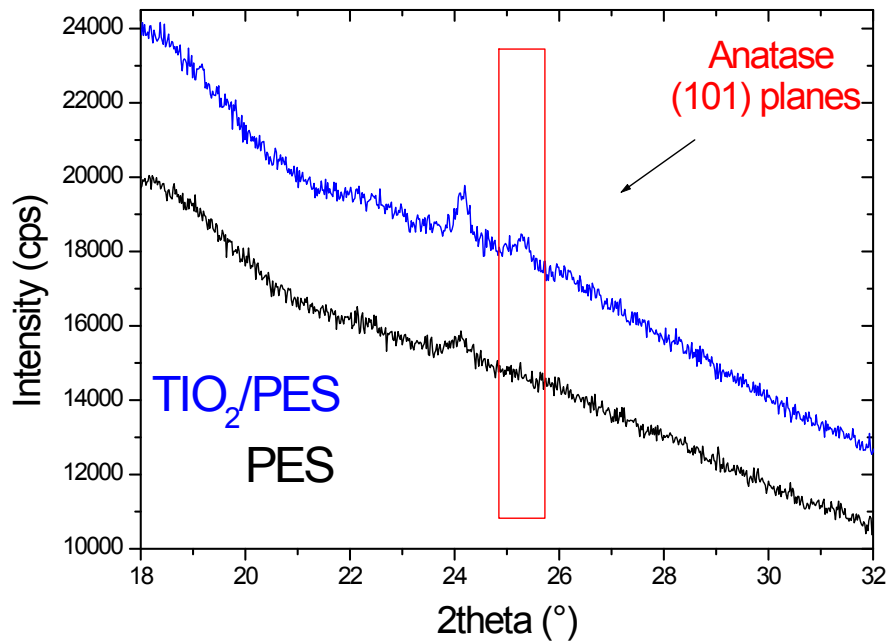
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SI1.SEM image of PES fibers without TiO₂ coverage



SI2. XRD patterns of PES (–) and that of TiO₂/ PES (–) meshes. As a difference between the two, a peak located at $2\theta=25.3^\circ$ arises after Ti-O deposition by sputtering. This peak is associated to the (101) planes of the anatase structure. Since such contribution is characterized by the highest expected scattering factor, the other anatase contributions in the XRD pattern are expected with very low intensities. The peak at $2\theta=25.3^\circ$ has a Full Width at Half Maximum of $\sim 0.36^\circ$. On the basis of this, the average size of the TiO₂ domains, as estimated by applying the Debye-Scherrer formula, is ~ 20 nm, a value comparable with the TEM results. The XRD measurements provide a characterization over large area of our TiO₂/PES system, definitely demonstrating that our process (sputtering and stabilising annealing in air) produces anatase coverage at temperature as low as 160°C .