LAYER BY LAYER ASSEMBLY OF NANOARCHITECTURES FOR ENHANCING THE FLAME RETARDANCY OF PET AND PET-COTTON FABRICS

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In the recent years the Layer by Layer technique has arisen great interest in many research fields, concerning the enhancement of oxygen barrier properties, the building up of conductive thin films and the obtainment of substrates with antibacterial and antireflective properties and electrical conductive coatings [1]. This technique, which falls in the category of self-assembled coatings, was firstly discovered by Iler in 1966 [2]. Decades later, LbL was thoroughly studied by Decher who proposed a practical method for the deposition [3].

Nowadays, it has been reviewed several times and widely exploited for obtaining a multimaterial assembly, without any particular chemical modification: the specific controlled surface interactions achieved in between the deposited layers allow to either improve the physico-chemical properties of the substrates or to build surface-based devices.

In its simplest application, LbL requires an alternate immersion of the substrate in oppositely charged polyelectrolyte solutions/nanoparticle suspensions, thus giving rise to a structure of positively and negatively charged layers piled up on the substrate surface.

Because of the possibility to obtain organic or hybrid organic-inorganic nanoarchitectures on different substrates, LbL has recently opened up the way for achieving flame retardancy for fibres and fabrics. In this scenario, our study focuses on the possibility to enhance the thermal stability and flame retardancy of polyester and polyester-cotton blends [4-7].

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