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A Novel and Facile Approach to Prepare Self-cleaning Yellow Superhydrophobic Polycarbonates

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Abstract:

Self-cleaning coloured superhydrophobic surfaces can find huge market in decorative applications. Here we present a novel and simplistic approach to prepare self-cleaning yellow superhydrophobic polycarbonates by simple nitric acid treatment to attain yellow colour polycarbonate (PC) and subsequent surface silylation by methyltrichlorosilane (MTCS) for superhydrophobicity. A colour of PC can be controlled from light to dark yellow by simply varying the immersion time in nitric acid. The surface silylation by MTCS provides morphologies from nanofibers to nanospheres depending on reaction times. These morphologies are responsible to achieve superhydrophobicity on yellow coloured PC with water contact angle higher than 155° and sliding angle less than 8°. The yellow superhydrophobic PC showed self-cleaning properties, where the dust particles from the surface were easily taken away by rolling water drops. After several water jet impact tests (oblique to vertical angle), no loss in superhydrophobic behaviour was observed confirming its mechanical stability.

Keywords: Coloured Coating; Superhydrophobic; Self-cleaning; Wetting; Contact angle.

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