

Research Article

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Proposing a sustainable strategy for the fabrication of robust anti-soiling coatings with enhanced antibacterial attributes for non-absorbent substrates

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In this paper, we propose a convenient methodology for fabricating a generic structure toward developing a robust, easy-to-clean transparent coating with inherent antibacterial properties for smooth, non-absorbent surfaces, such as glass and plastics. A two-step coating comprising an organopolysilazane primer and an alkoxysilane topcoat, based on positively charged quaternary ammonium salts, was developed. The resulting coating exhibited excellent antibacterial activity against *Staphylococcus aureus* and *Escherichia coli*. The coating also showed excellent anti-soiling properties, as evidenced by the low surface energy and the high water contact angle. The coating was also highly durable, as evidenced by the high mechanical strength and the high thermal stability.

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