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Abstract

The use of bio-inspired polydopamine (PDA) chemistry for membrane development has attracted increasing interest in recent years. This paper reports on the fabrication of new nanofiltration (NF) membrane with a robust and permeable barrier layer based on dopamine assisted co-deposition strategy. Hydrophilic and hydroxyl-rich polymer poly(vinyl alcohol) (PVA) was used as the key building block for co-deposition, successfully entrapping it within the self-polymerized polydopamine (PDA) matrix with stabilization through intermolecular hydrogen bonding between PVA and PDA moieties. As a result, visibly denser, thicker and more hydrophilic co-deposited layers were formed on polysulfone (PSf) substrates compared to the pure PDA layer. The surface properties of the co-deposited layers were found to be sensitive to the amount of PVA incorporated within the coating layers, while the latter positively correlated with the content of PVA in dopamine coating solution. Further crosslinking with highly electrophilic trimesoyl chloride (TMC) as a covalent linker effectively tightened the co-deposited layers, yielding NF