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# Supplementary Materials: Surfactants for Electrophoretic Deposition of Polyvinylidene Fluoride–Silica Composites

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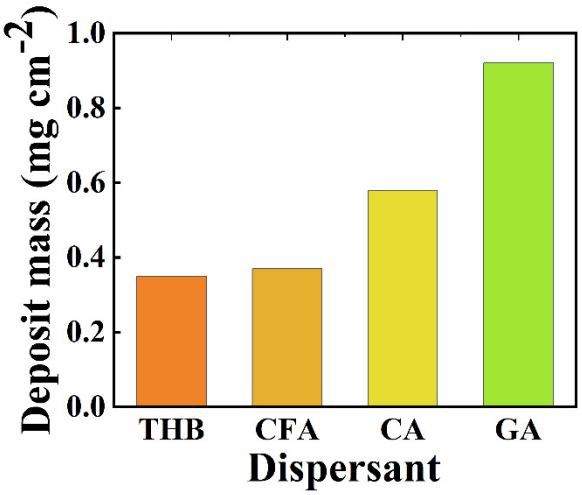


**Figure S1.** Deposit mass achieved for different dispersants using 5 g $L^{-1}$ PVDF suspensions containing 1 g $L^{-1}$ dispersants for deposition time of 5 min and deposition voltage of 50V.

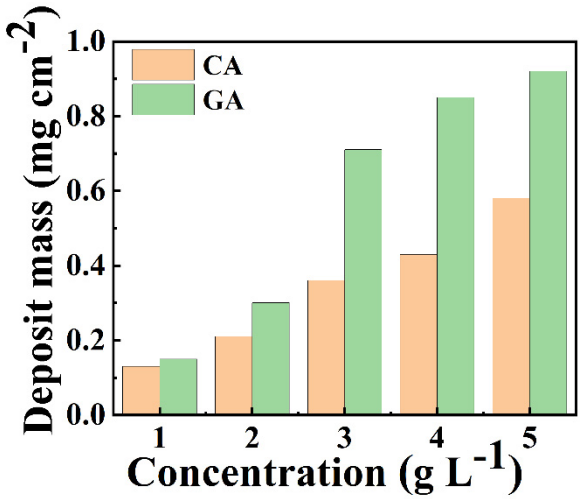


**Figure S2.** Deposit mass versus PVDF concentration in suspensions, containing 1 g $L^{-1}$ dispersants for deposition time of 5 min and deposition voltage of 50V. .

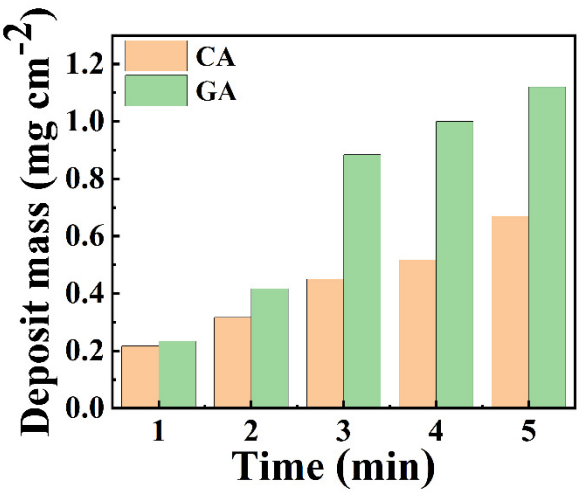


**Figure S3.** Deposit mass versus deposition time at a deposition voltage of 100 V for 5 g $L^{-1}$ PVDF suspensions.

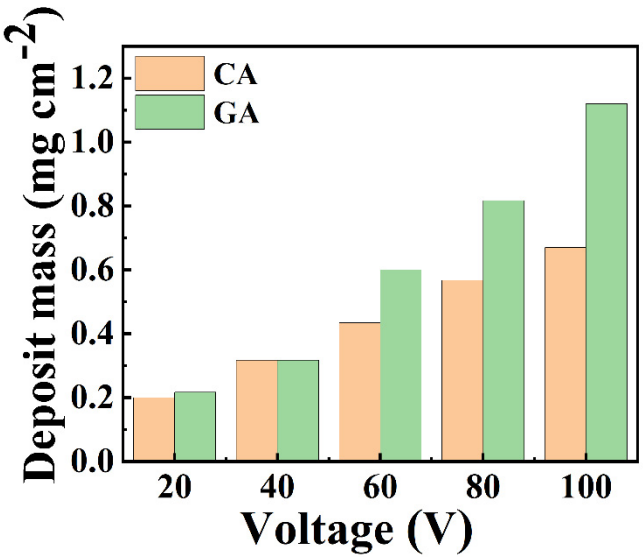


**Figure S4.** Deposit mass versus deposition voltage for 5 g $L^{-1}$ PVDF suspensions at deposition time of 5 min.

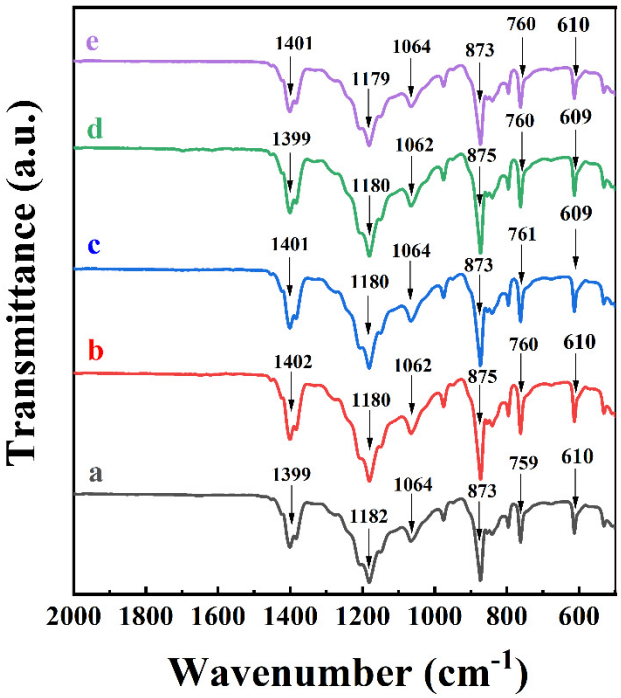


**Figure S5.** FTIR spectra of deposits, prepared from using 5 g $L^{-1}$ PVDF suspensions containing 1 g $L^{-1}$ dispersants: (a) THB, (b) CFA, (c) CA, (d) GA for deposition time of 5 min and deposition voltage of 100V and (e) as-received PVDF.

The spectra of deposied materials contains peaks similar to the peaks of as-received PVDF. The strong broad absorption at 1401 $cm^{-1}$ in the spectrum of as-received PVDF resulted from wagging of $CH_2$ and antisymmetric stretching of C-C bonds[1]. Other strong bands at 1179 and 873$cm^{-1}$ were associated with the stretching and rocking of $CF_2$ bonds[1, 2].

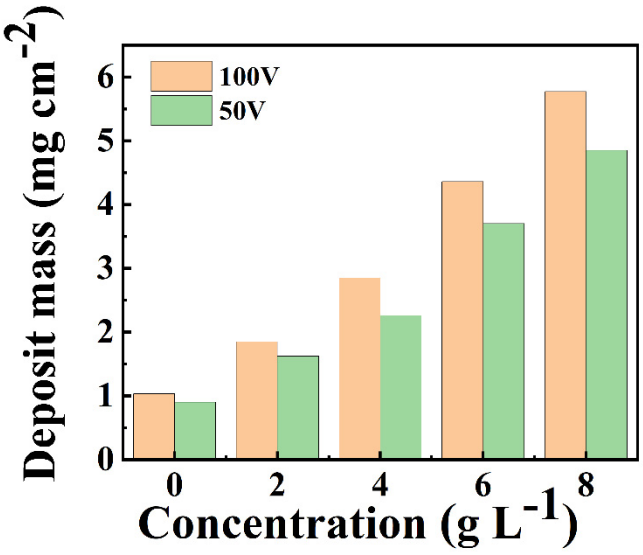


**Figure S6.** Deposit mass versus nanosilica concentration in 5 g $L^{-1}$ PVDF suspension containing 2 g $L^{-1}$ GA at deposition time of 5 min at voltages of 50 V and 100 V.

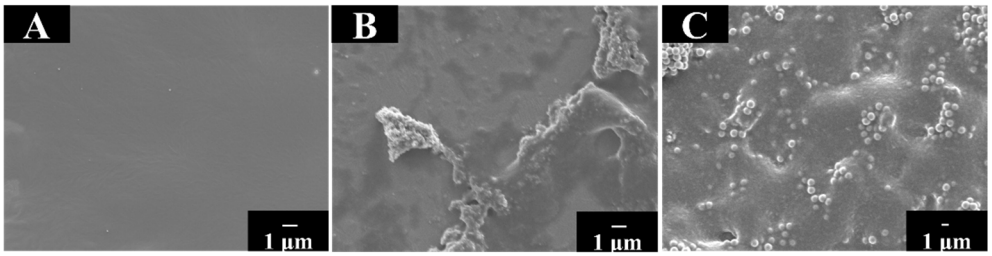


**Figure S7.** SEM images of coatings, prepared from 5 g $L^{-1}$ PVDF solution, containing 1 g $L^{-1}$ GA (A) witthout silica, (B) with 1 g $L^{-1}$ nanosilica and (C) with 1 g $L^{-1}$ micron size silica deposited at a deposition voltage of 100V and deposition time of 5 min and annealed at 200°C for 1 h.

1. Kobayashi, M.; Tashiro, K.; Tadokoro, H. Molecular vibrations of three crystal forms of poly (vinylidene fluoride). *Macromolecules* **1975,** 8, 158-171.
2. Zeng, Z.; Yu, D.; He, Z.; Liu, J.; Xiao, F.-X.; Zhang, Y.; Wang, R.; Bhattacharyya, D.; Tan, T. T. Y. Graphene oxide quantum dots covalently functionalized PVDF membrane with significantly-enhanced bactericidal and antibiofouling performances. *Scientific reports* **2016,** 6, 1-11.