Electronic Supplementary Material (ESI) for RSC Advances.

[Supporting Information]

Fabrication of polyvinylidene fluoride cactus-like nanofiber through one-step electrospinning

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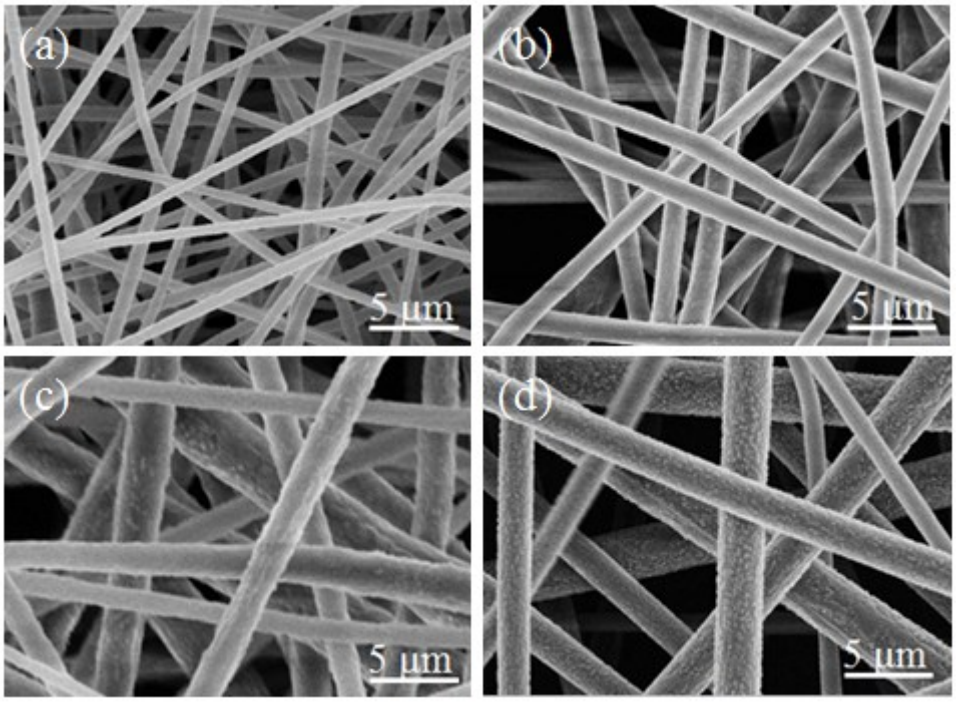

Fig. S1 SEM images of PVDF fibers electrospun at different levels of RH. (a) 2%, (b) 22%, (c) 42%, and (d) 62%.

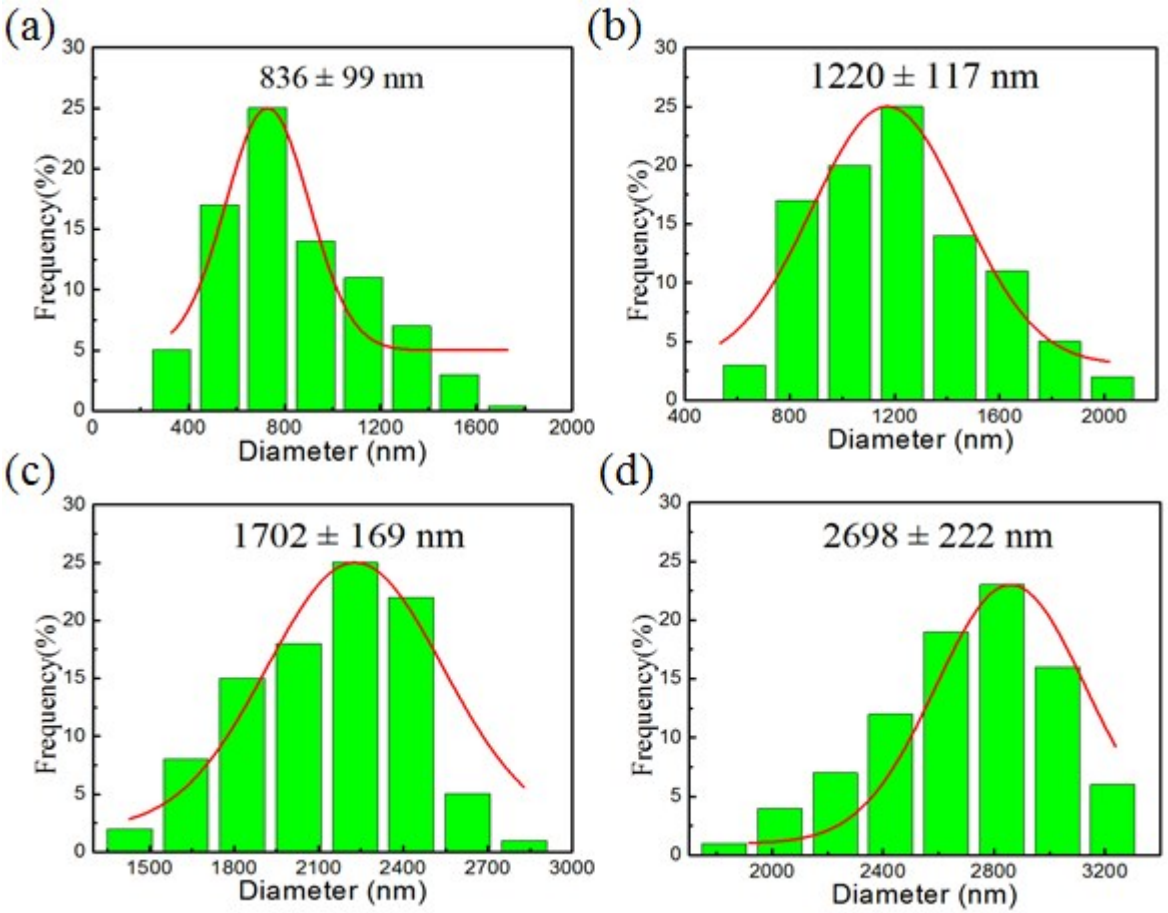

Fig. S2 Histogram of diameter distribution of PVDF fibers electrospun at different levels of RH. (a) 2%, (b) 22%, (c) 42%, and (d) 62%.

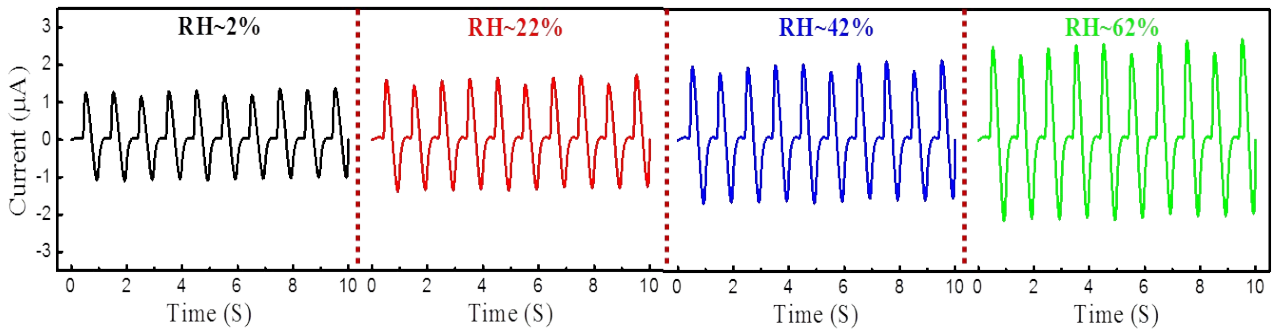

Fig. S3 Current output generated by the PENG based on PVDF fiber webs at different levels of RH.

Determination the content of β phase (F[β]) and crystallinity (ΔXc)

The F(β) can be calculated using the Eq.(S1):

$$F(\beta)=X_\beta/(X_\alpha+X_\beta)= A_\beta/[(K_\beta/K_\alpha)A_\alpha+A_\beta]=A_\beta/[1.26A_\alpha+A_\beta] \quad (S1)$$

Where X_α and X_β are the crystalline rate of α and β phases, respectively. A_α and A_β represent the height of absorption bands at 762 and 840 cm^{-1}, respectively. K_α=6.1×104 cm^2/mol and K_β=7.7×104 cm^2/mol are the absorption coefficients at the respective wavenumber [1-5].

The ΔX_c can be calculated according to the Eq. (S2):

$$\Delta X_c= \Delta X_m/ (X\Delta X_\alpha+Y\Delta X_\beta) \quad (S2)$$

Where, ΔX_m is the melting enthalpy of the sample; ΔX_α=93.07 J/g and ΔX_β=103.4 J/g are the melting enthalpy of a 100% crystalline sample in α and β phases, respectively, while X and Y are the amounts of α and β phases in the sample, respectively [1, 2, 5].

References

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