Supporting Information

Construction of Ultra-stable Perovskite-Polymer Fiber Membranes by Electrospinning Technology and its Application on Light-Emitting Diodes

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Figure S1. Water contact angle of PS thin film (1), MAPbBr₃@PS thin film (2), PS fibers (3), MAPbI₃@PS fibers (4), MAPbI₂Br@PS fibers (5), MAPbIBr₂@PS fibers (6), MAPbBr₃@PS fibers (7), MAPbBr₂Cl@PS fibers (8) and MAPbBrCl₂@PS fibers (9).



Figure S2. Typical SEM images of MAPbBr₃@PS fibers with different MAPbBr₃ concentrations introduced in the electrospinning solution: a) 1.25%; b) 2.5%; c) 5%; d)7.6%; e) 10%; f) 15%. It can be seen that the morphology of the MAPbBr₃@PS fibers is the best when 10% concentration of MAPbBr₃in it.



Figure S3. The Norm. PLQY of MAPbBr₃@PS fibers with different MAPbBr₃ concentrations introduced in the electrospinning solution: a) 1.25%; b) 2.5%; c) 5%; d)7.6%; e) 10%; f) 15%. It can be seen that the Norm. PLQY of the MAPbBr₃@PS fibers is the best when 10% concentration of MAPbBr₃ in it.



Figure S4. EDS spectra of the MAPbBr₃@PS fibers a)-e), which is shown the existence of MAPbBr₃ in the film.



Figure S5. XRD patterns of MAPbBr₃@PS fibers with the PDF card of MAPbBr₃ (01-076-2758) and PS (00-013-0836).



Figure S6. Photograph of MAPbBr₃@PS fiber film under a light a) and 365 nm UV lamp b).



Figure S7. a) UV–vis absorption and PL spectra of MAPbBr₃@PS fibers film. The insert picture is its Tauc plot; b) Time-resolved PL decay (black) and fitting curve (red) of MAPbBr₃@PS fibers with excitation at 365 nm.



Figure S8. Photos of MAPbX₃@PS fibers with different halogen constitutions: a) MAPbCl₂Br, b) MAPbClBr₂, c) MAPbBr₃, d) MAPbBr₂I, e) MAPbBrI₂, and f) MAPbI₃. The corresponding UV–vis absorption spectra g) and Tauc plot h) of MAPbX₃@PS fibers.



Figure S9. EDS spectrum of MAPbI₃ a), MAPbBrI₂b), MAPbBr₂I c), MAPbBr₂Cl d)



and MAPbBrCl₂e) and the corresponding SEM images.





b) MAPbBr₃@PS thin film (PS-2). Note it is a secondary heating and cooling cycle.

Figure S11. XRD curves of MABr powder, the standard PDFcard information of MABr is shown below (PDF Card: 00-10-0699).

