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# Unveiling high-power and high-safety lithium-ion battery separator based on interlayer of ZIF-67/cellulose nanofiber with electrospun poly(vinyl alcohol)/melamine nonwoven membranes

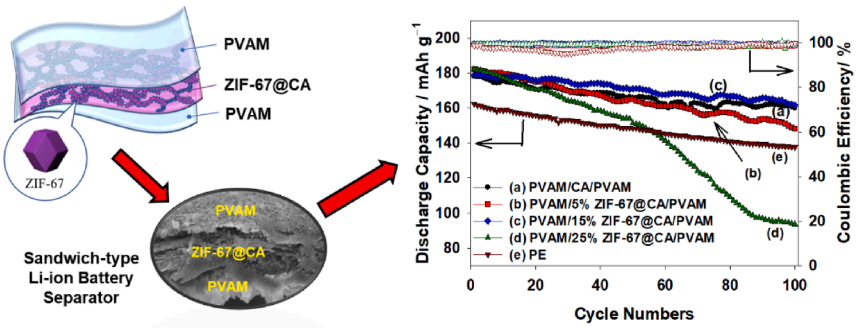
Xiao-Wei Wu [a,b], Chelladurai Karuppiah [a,*], Yi-Shiuan Wu [a], Bo-Rong Zhang [a,b], Li-Fan Hsu [a], Jeng-Ywan Shih [a,b], Ying-Jeng James Li [a,b], Tai-Feng Hung [a], Sayee Kannan Ramaraj [c], Rajan Jose [d], Chun-Chen Yang [a,b,e,*]

[a] Battery Research Center of Green Energy, Ming Chi University of Technology, New Taipei City 24301, Taiwan, ROC
[b] Department of Chemical Engineering, Ming Chi University of Technology, New Taipei City 243, Taiwan, ROC
[c] PG and Research Department of Chemistry, Thiagarajar College, Madurai, Tamil Nadu, India
[d] Center for Advanced Intelligent Materials & Faculty of Industrial Sciences and Technology, University Malaysia Pahang Al-Sultan Abdullah, 26300 Kuantan, Pahang, Malaysia
[e] Department of Chemical and Materials Engineering, Chang Gung University, Kwei-shan, Taoyuan 333, Taiwan, ROC

## HIGHLIGHTS

- High-power and high-safety lithium-ion batteries composite membrane was developed.
- ZIF-67 filler deposited on cellulose acetate fibers ($Z_{67}$@CA) by in situ growth method.
- Sandwich structure developed with electrospun poly(vinyl alcohol)/melamine nonwoven membranes (Esp-PVAM).
- The Esp-PVAM/15%$Z_{67}$@CA/Esp-PVAM membrane exhibited good capacity retention of 90.34% (1C) for 100 cycles.
- The Esp-PVAM/15%$Z_{67}$@CA/Esp-PVAM membrane has a good dendrite suppression and thermo-resistant properties.

## GRAPHICAL ABSTRACT




## ARTICLE INFO

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## ABSTRACT

Due to the poor thermal stability of conventional separators, lithium-ion batteries require a suitable separator to maintain system safety for long-term cycling performance. It must have high porosity, superior electrolyte uptake ability, and good ion-conducting properties even at high temperatures. In this work, we demonstrate a novel composite membrane based on sandwiching of zeolitic imidazole frameworks-67 decorated cellulose acetate nanofibers (ZIF-67@CA) with electrospun poly(vinyl alcohol)/melamine (denoted as PVAM) nonwoven membranes. The as-prepared sandwich-type membranes are called PVAM/x%ZIF-67@CA/PVAM. The middle layer of composite membranes is primarily filled with different weight percentages of ZIF-67 nanoparticles (x = 5, 15,

* Corresponding authors at: Battery Research Center of Green Energy, Ming Chi University of Technology, New Taipei City 24301, Taiwan, ROC (C.-C. Yang).
*E-mail addresses:* kcdurai.rmd@gmail.com (C. Karuppiah), ccyang@mail.mcut.edu.tw (C.-C. Yang).

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