

Accepted Manuscript

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PII: S0013-4686(15)30489-8

DOI: <http://dx.doi.org/doi:10.1016/j.electacta.2015.09.077>

Reference: EA 25710

To appear in: *Electrochimica Acta*

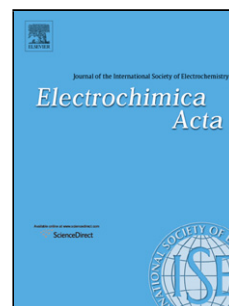
Received date: 30-6-2015

Revised date: 14-9-2015

Accepted date: 14-9-2015

Please cite this article as: Qingfu Wang, Robust and thermal-enhanced melamine formaldehydendashmodified glassfiber composite separator for high-performance lithium batteries, *Electrochimica Acta* <http://dx.doi.org/10.1016/j.electacta.2015.09.077>

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Robust and thermal-enhanced melamine formaldehyde–modified glassfiber composite separator for high-performance lithium batteries

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Abstract

The composite separator of melamine formaldehyde resin coated glass microfiber membrane was prepared for high performance lithium ion battery. It was demonstrated that this composite membranes possessed a significantly enhanced tensile strength and a modified porous structure, compared with that of pristine glass microfiber membrane. Impressive improvements in thermo-stability, with no shrinkage at an elevated temperature of 150 °C. Meanwhile, such composite membrane presented a favorable wettability and remarkable electrochemical stability in commercial liquid electrolyte. In addition, the battery test results of LiCoO₂/graphite cells proved the composite membrane was a promising separator with an improved cycling performance and rate capability. The cycle performance of LiFePO₄/Li cells at the elevated temperature of 120 °C demonstrated their excellent safety characteristic as separator in LIB, indicating the composite membrane was a potential separator candidate for high power battery.

Key words: melamine formaldehyde, glassfiber, composite membrane, thermal stability, lithium batteries

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