Polymer electrolytes to improve the safety of lithium ion batteries for electric vehicles

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 Lithium ion batteries present dominant advantages over traditional rechargeable battery systems. However, their safety becomes a major concern due to the use of organic liquid electrolytes since there are a lot of reports on fire and explosion. However, lithium ion batteries are of great promise as power sources for electric vehicles to increase the utilization efficiency of energy and reduce the emission of CO2. As a result, the safety issue is of great concern. If liquid electrolyte can be substituted by polymer electrolytes, the safety will be greatly improved. In our laboratory, we developed several methods to improve the performance such as mechanical strength, safety and incombustibility of the polymer membranes: phase inversion, foaming process and sandwiched structure. This work provides a good solution to promote the practical application of polymer electrolytes and the corresponding electric vehicles.