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Effect of polydopamine-modified surface for electrospun $LiFePO_4$ cathode material

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Although the attainable specific energy density and cycle stability of $LiFePO_4$ is only higher than that of $LiCoO_2$, $LiFePO_4$ has the low electronic and ionic conductivity. The common strategy to solve this problem was to downsize LiFePO4 and to coating the nano-crystal with conductive carbon film. This study was prepared nano-sized $LiFePO_4$/C cathode material by electrospinning method and surface of manufactured cathode material was fabricated by a facile and cost-effective dip-coating method to improve the interfacial hydrophilic, electrical conductivity and electrochemical performance of electrode. Due to the PDA coating, it makes the nano-fiber surface hydrophilic and thus increases the electrolyte uptake and ionic conductivity, resulting in the enhanced performance of Li-ion batteries. PDA-$LiFePO_4$ and uncoated cathode material were evaluated by contact angle test and uptake volume of liquid electrolyte, AFM, FE-SEM (field emission scanning electron microscope) and electrochemical measurements. The results improved electrochemical performance and hydrophilic property of PDA coated cathode material compared to bare cathode material.

Biography

Mi-Ra Shin has attendant Korea National University of Transportation and majored in rechargeable batteries and manufactures nanofibers of various compositions using electro-spinning. In addition, she has published more than two papers in a reupted journal.

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