KOH-activated porous carbon derived from hydrothermal processed lignin for energy and environmental applications

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Investigations on biomass conversion technologies are carrying out intensively. Biomass is emerging as a promising material for application in energy storage systems due to their properties such as abundance, environmental-friendly and ease of processing. In this study, we focus on a kind of biomass of agricultural waste which is oil palm empty fruit bunch (EFB). Our strategy is to convert lignin in EFB to porous carbon material with ultrahigh surface area as an alternative material to established activate carbon.
The activated carbon char derived from EFB witch pyrolyzed in presence of KOH shows very high porosity. The KOH acts as an activating agent that can react with oxygen-contained functional group to results in highly microporous architecture.
EFB-derived activated carbon shows ultrahigh specific surface area and micro-size of average pore diameter. The product can enhance ion accessability and also provides excellent electron percolation properties leading to high power delivery. Therefore, understanding the electrochemical performance for energy storage applications to replace conventional activated carbon is further investigated.