The impact of various demineralization steps of Cocoa Pod Husk on the performance of hard carbons for sodium batteries

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Hard carbons (HC) are the most promising anode materials for Na-ion batteries (NIBs). Among the candidates of carbon precursor for HC, a biomass waste is the most appropriate sources of HC because of its low cost and availability. In fact, the biomass waste itself is not a pure chemical, it contains different composition of lignocellulosic materials with a wide variety of inorganic, leaving the complex behavior of each biomass precursor for the formation of microporous structure of HC. Therefore, biomass preparation methods are a critical step to achieve high performance anode material for NIBs. Herein, high-temperature calcination was used to synthesize HC from cocoa pods husk (CPH). It contains of 12 wt% inorganic, dominating by K^+ and Ca^+. Different biomass preparation methods were investigated under two different calcination temperatures (1100 and 1300°C). The demineralization of biomass before calcination (Pre-demin), without any demineralization (No-demin) and the demineralization step after calcination (Post-demin) were investigated to the HC performance as an anode for NIBs.