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## Activated carbon/Nickel-Aluminium double layer hydroxide composites for supercapacitor applications

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In this study, a detailed analysis of the electrochemical performance of activated carbon/Nickel-Aluminium layered double hydroxide (AC/NiAl-LDH) composites were investigated as potential electrode materials for electrochemical capacitors. The activated carbon (AC) was prepared via optimization of the carbonization temperature and activating agent (potassium hydroxide) from a tree-bark biomass raw material. Subsequently, porous NiAl-LDH was also obtained using a solvothermal technique by varying the syntheses times. The optimized activated carbon sample was then added to the NiAl-LDH sample in different masses to produce an AC/NiAl-LDH composite material. The morphology revealed an interconnected framework of both the AC and LDH structures. The specific surface area (SSA) of the AC/NiAl-LDH composite was seen to improve with an increase in the amount of AC added to the NiAl-LDH material. This increase in SSA enabled a better charge transfer propagation and charge storage within the composite when adopted as electrodes for supercapacitor. A specific capacity of 18.90 mAh/g was obtained for the AC/NiAl-LDH composite material. The results obtained demonstrate the potential of this composite material as electrodes for energy storage devices.

**Apply to be considered for a student &nbsp; award (Yes / No)?**

Yes

**Level for award&nbsp;(Hons, MSc, &nbsp; PhD, N/A)?**

Msc

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**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

No

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