

International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)

Balapur P.O., Hyderabad – 500005, Telangana, India



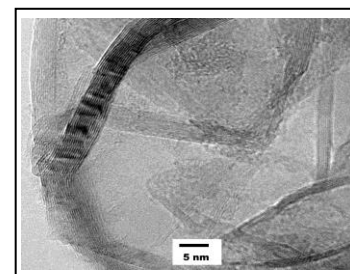
Mesoporous carbon for high performing Supercapacitors

Overview

The nanostructured materials particularly, mesoporous carbon is considered attractive electrode material for supercapacitor application owing to its promising characteristics like well-ordered pore structure, high surface area, narrow pore size distributions and large pore volume. ARCI is focussing on the synthesis of mesoporous carbon by nanocasting method, evaporation induced self-assembly and from various bio-wastes. This shows significant increase in specific capacitance and capacitance retention at high rates in comparison with commercial activated carbon. The high performance of mesoporous carbon is attributed to its excellent textural parameters (high specific surface area, large pore volume, ordered carbon etc.) which assist in large flow of the electrolyte ions to the active surface sites and makes the surface of mesoporous carbon more favourable for charging the double layer.

Key Features

- Facile synthesis of mesoporous carbon
- Synthesis of ordered graphitic carbon, graphene like sheets
- Excellent textural parameters
- Specific capacitance higher than commercial carbon
- High energy density based supercapacitor
- Scalable manufacturing process



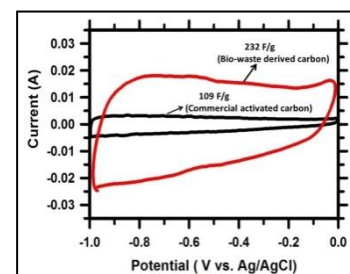
HR-TEM image of Bio-waste derived mesoporous carbon

Potential Applications

- Automotive transport (electric bus, electric bicycles, electric cars)
- Consumer electronics (voltage stabiliser, grid power buffer, street lamps)
- Energy recovery (trams, cranes, tractors)

Intellectual Property Development Indices (IPDI)

- Synthesis and electrochemical performance at laboratory scale
- Bulk-scale-up synthesis is underway



CV performance of bio-waste carbon in comparison to commercial one

Status	1	2	3	4	5	6	7	8	9	10

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