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WM-1605: VERTICALLY ORIENTED GRAPHENE NANOSHEETS ON ALUMINUM ELECTRODES

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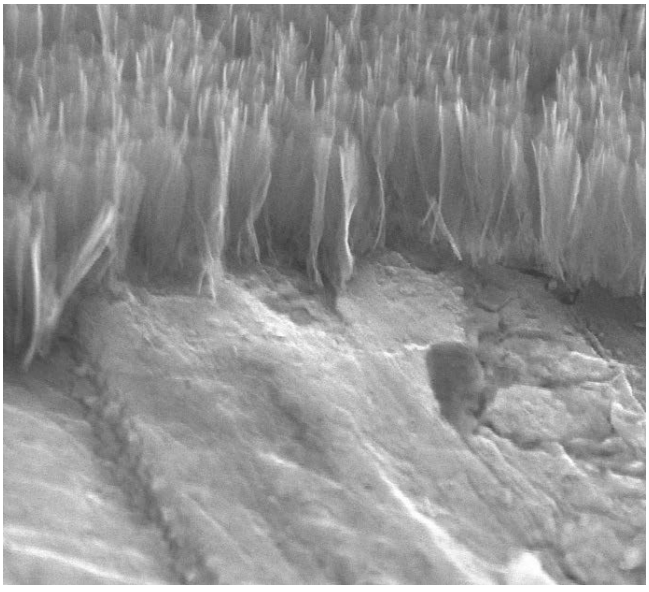
Application: Capacitors, Electric Double Layer Capacitors (Supercapacitors)

Technology Background: An important requirement for capacitors used for power leveling and ripple filtering is quick response in absorbing and releasing energy. At present, this is primarily performed by aluminum electrolytic capacitors. These are voluminous bulky components, and they fail irreparably. In other words, conventional electrolytic capacitors, such as those with a dielectric of metal oxide on a metal, are large and generally have low reliability.

Electric double layer capacitors (EDLCs), often referred to as supercapacitors or ultracapacitors, address many of the problems of conventional electrolytic capacitors. First, EDLCs can have higher capacitance per unit area compared with those conventional capacitors, often two orders of magnitude greater capacitance at the same size. EDLCs also circumvent the reliability problem common to electrolytic capacitors. EDLCs are widely used for energy storage.



EDLCs made with vertically oriented graphene nanosheets (VOGN) grown on nickel substrates have shown tremendous performance, but shown promising capacitive and response time results, but the nickel substrates are expensive and heavy.

For the first time, we have grown VOGN on inexpensive, lightweight aluminum foil sheets, potentially revolutionizing manufacture of VOGN for use in EDLCs.

Intellectual Property: Issued U.S. Patent No. 10,056,198

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