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(54) **PROCESS FOR PRODUCING NANO-SCALED GRAPHENE PLATELET NANOCOMPOSITE ELECTRODES FOR SUPERCAPACITORS**

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(58) **Field of Classification Search** ..... None
See application file for complete search history.

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(57) **ABSTRACT**

A process for producing meso-porous nanocomposite electrode comprising nano-scaled graphene platelets. The process comprises: (A) providing nano-scaled graphene platelets, wherein each of the platelets comprises a single graphene sheet or a stack of multiple graphene sheets, and the platelets have an average thickness no greater than 100 nm (preferably less than 5 nm and most preferably less than 2 nm in thickness); (B) combining a binder material, the graphene platelets, and a liquid to form a dispersion; (C) forming the dispersion into a desired shape and removing the liquid to produce a binder-platelet mixture; and (D) treating the binder material under a desired temperature or radiation environment to convert the binder-platelet mixture into a meso-porous nanocomposite electrode, wherein the platelets are bonded by the binder and the electrode has electrolyte-accessible pores characterized in that the nanocomposite has a surface area greater than about 100 m^2/gm (preferably greater than 200 m^2/gm, more preferably greater than 500 100 m^2/gm, and most preferably greater than 1,000 m^2/gm). A supercapacitor featuring such a nanocomposite exhibits an exceptionally high capacitance value.

40 Claims, 8 Drawing Sheets