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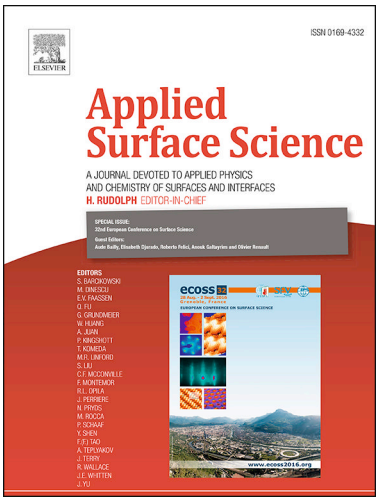

Full Length Article

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Alumina-coated and manganese monoxide embedded 3D carbon derived from avocado as high-performance anode for lithium-ion batteries

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KEYWORDS: avocado fruit; 3D carbon; manganese oxide; alumina coating; anode; lithium-ion batteries

ABSTRACT

Derived from avocado fruit, a three dimension (3D) carbon is prepared *via* a hydrothermal/pyrolysis process followed by embedding with MnO nanoparticles by a wet chemical method and coating with Al_2O_3 through an atomic layer deposition technique. The obtained material presents a hierarchical structure that MnO nanocrystalis wrapped in 3D carbon and then encapsulated in a uniform Al_2O_3 layer with a thickness of about 5 nm. Benefiting from this hierarchical structure in which 3D carbon offers numerous electronic pathways to enhance the conductivity and Al_2O_3 nanolayer provide a shelter to keep away from dissolution of Mn^{4+} and