**Edge-Functionalised Graphene Formulations as Moldable Electrode Materials**

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The recent discoveries of binder-free clay, paste and soft dough forms of carbon nanotubes, 2D transition metal dichalcogenide (TMD) materials and graphene oxide utilizing the solvent interaction properties open up new forms of 3D conductive materials that can be made into the desirable geometrics and structures.1, 2, 3 The chemical modification of graphene oxide can lead to water-based pastes, membranes and doughs due to its extensive number of functional groups.3, 4, 5 However, as a result of high defects, poor electrical conductivity and the presence of a large ratio of carbon-carbon *sp3* bonds restricted the functional applications of graphene oxide. On the other hand, graphene with its high conductivity and defect-free basal plane is hydrophobic in nature and it is typically not possible to form processable forms such as a paste or dough. Nonetheless, We have invented and patented a new type of graphene, edge functionalised graphene (EFG), that is scalable and highly dispersible in water and other organic solvents that leading to the formation of three-dimensional geometric shapes without any binder.6 This highly conductive additive-free graphene formulations have the potential to create excellent opportunities to develop shapable energy storage system and moldable electrode materials.

References

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