

### Preparation of the porous 3-D graphene composites

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The 2-D graphene nano-sheets composites with polymer and various metal oxides have been reported to be used in various applications. These 2-D structures interfere with ionic and electronic transport kinetics due to their graphene aggregation. However, this problem was solved by constructing three-dimensional structure with macro-pores by the wet method. In addition, as part of the solution, the 3-D spherical mesoporous RGO composites with 2-D alternating layers were synthesized by the spray method. These materials have, therefore, high potentials to be applicable in various fields including catalysts, nano-electronics, energy storage materials and photo-electron devices.