

Generalized Synthesis of the Family of Multishelled Metal Oxide

Hollow Microspheres

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Supporting Information

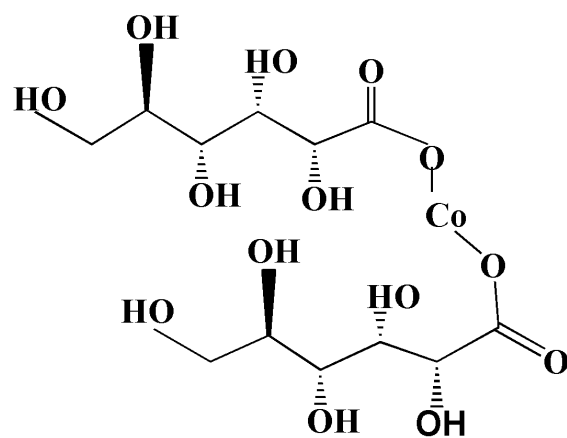


Figure S1 Molecular structure of Co(II) gluconate.

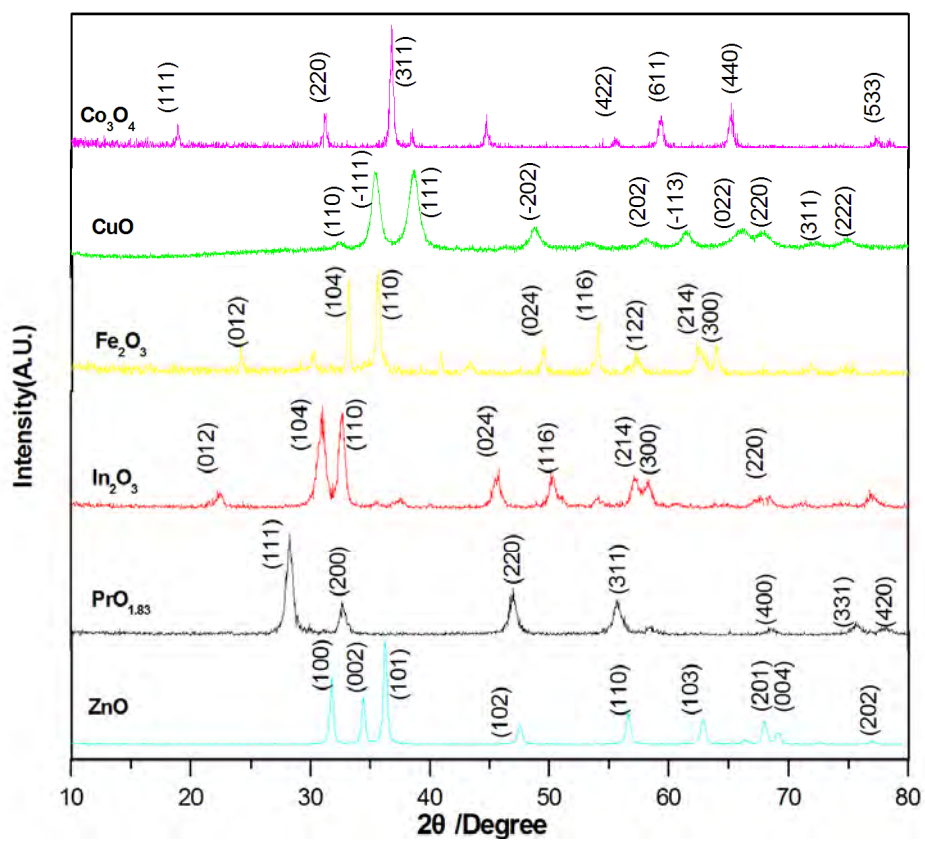


Figure S2 XRD patterns of the various multishelled microspheres.

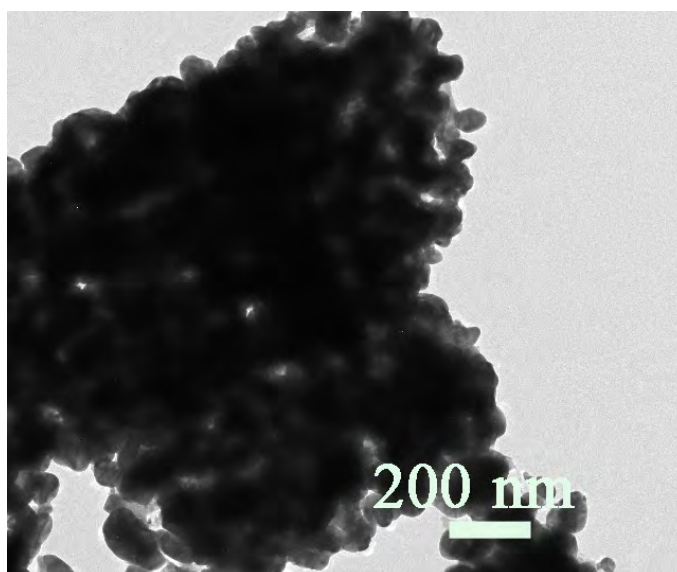


Figure S3 TEM image of the carbon particle with hydrothermal treatment of cobalt(II) gluconate for 1 h.

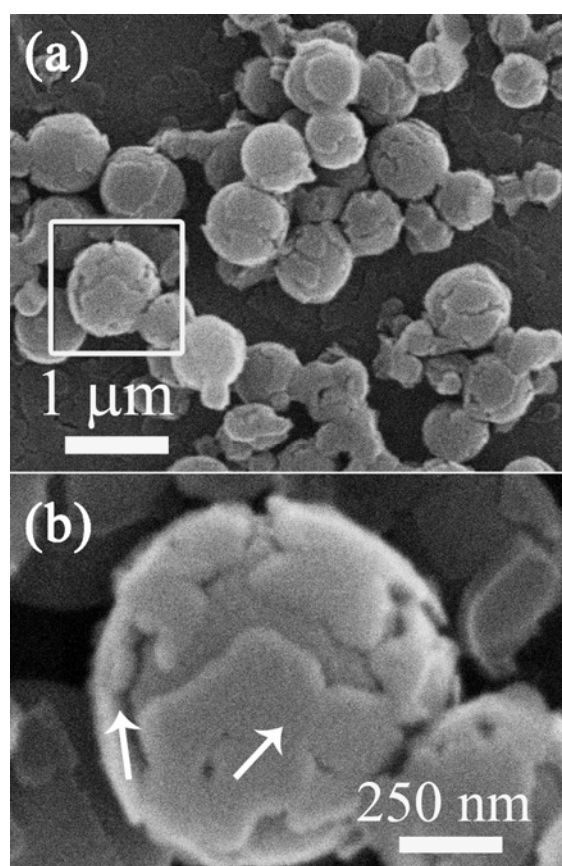


Figure S4 SEM images of carbon microspheres with hydrothermal reaction of cobalt(II) gluconate for 4 h. (b) is the magnification of the selected area in (a).

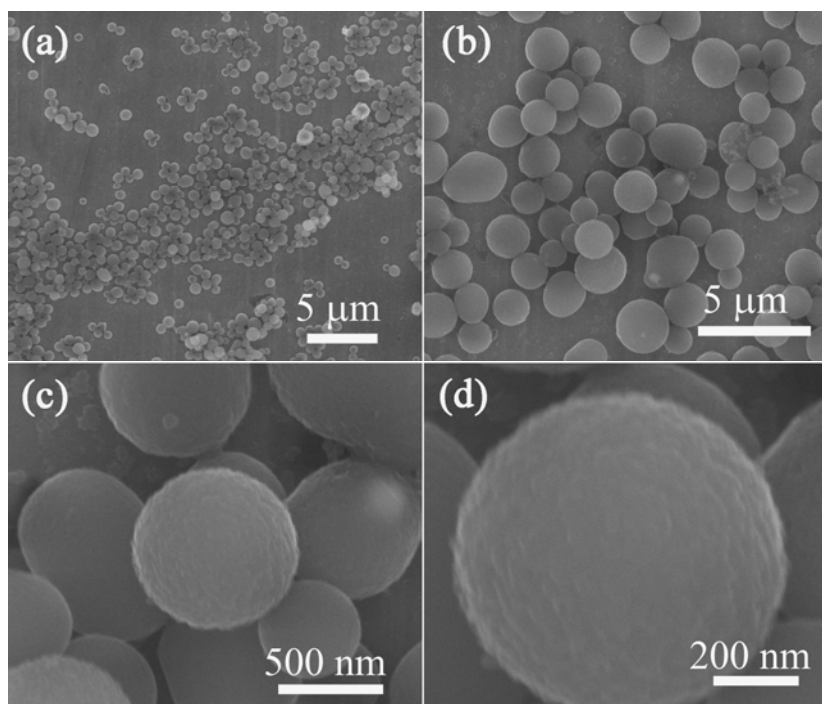


Figure S5 FE-SEM images of spherical carbon obtained with hydrothermal treatment of cobalt(II) gluconate for 20 h at different magnification.

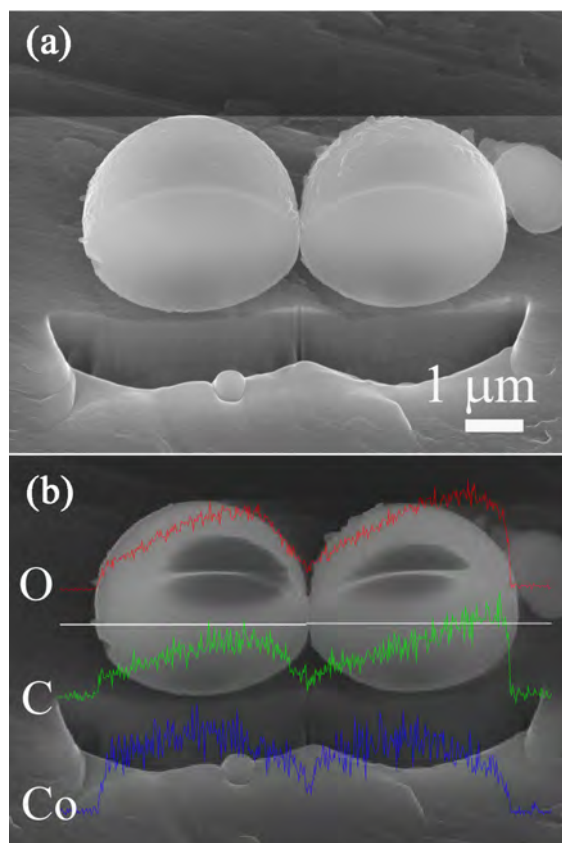


Figure S6 SEM images of (a) two carbon microspheres after FIB cutting, (b) corresponding elemental mapping of the cross-section

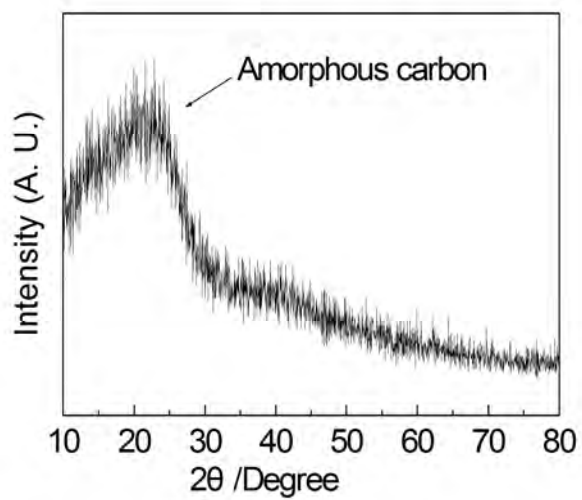


Figure S7 XRD pattern of the as-prepared carbon sphere obtained with hydrothermal treatment of cobalt(II) gluconate for 20 h.

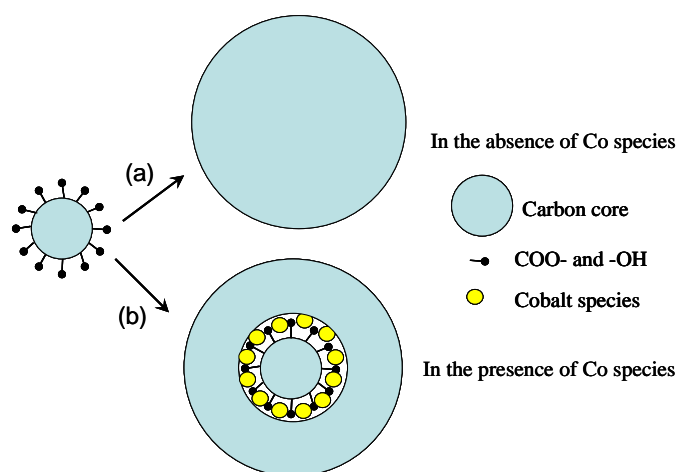


Figure S8 Schematic illustration: (a) condensation of the cores to form the larger cores with carbonization process in the absence of Co species. (b) The existence of Co moiety may act as an interface to lead the newly carbonized reactant to growing as a new out layer of the existent carbon cores.

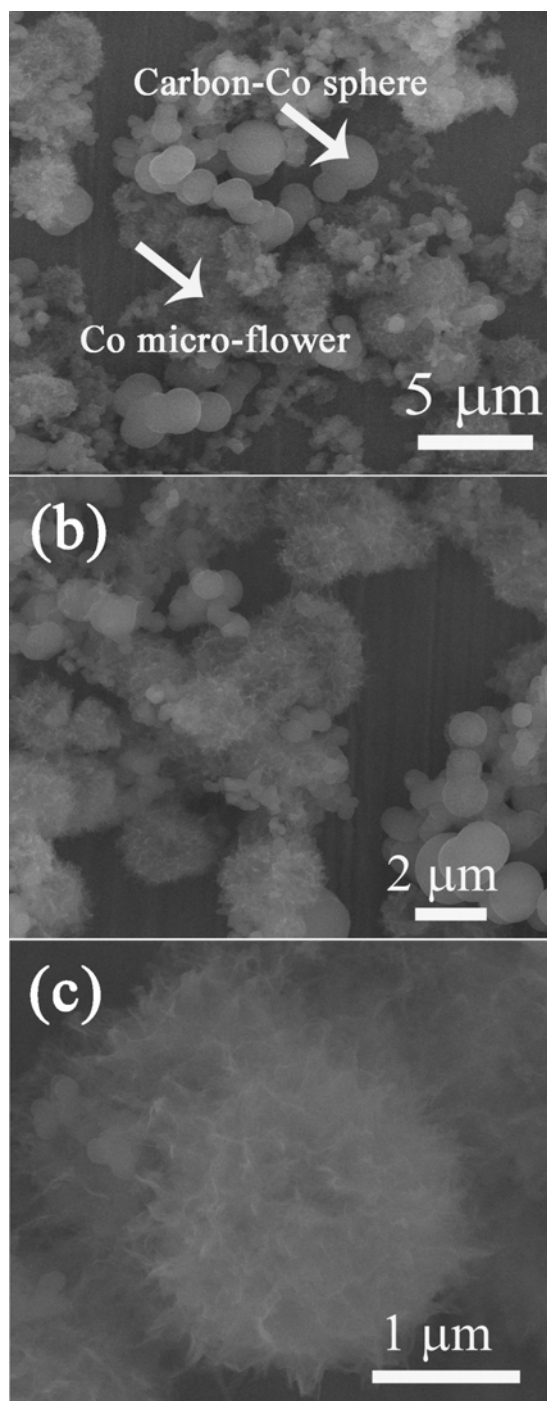


Figure S9 FE-SEM images of the products formed at pH solution of 5.4 at different magnification. The arrowheads in (a) reveal the carbon spheres and microflower-like Co oxides, respectively. (b) and (c) shows the microflower-like Co oxides consisting of tiny nanowires as building blocks.