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## Jun Chen

Key Laboratory of Advanced Energy Materials Chemistry (Ministry of Education),  
College of Chemistry, Nankai University, Tianjin 300071, China

[chenabc@nankai.edu.cn](mailto:chenabc@nankai.edu.cn)

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## Inorganic/organic and carbon composites for Li/Na Batteries

Electrode active materials have played a vital role in the working of rechargeable batteries because they are sources of electric energy with controlled electrode reactions. Either inorganic or organic electrode materials (particularly the positive electrode materials) show electrically insulating nature, which should be composited with carbon for enhancing the charge transport within the electroactive bulk. This report focuses on controlled synthesis of selected inorganic oxides and organic carbonyl salts with carbon composites via reduction-oxidation-transformation crystallization. Meanwhile, the as-synthesized inorganic/organic and carbon composites have demonstrated enhanced electrochemical performance in the application of rechargeable Li/Na (ion/metal) batteries (300~500 Wh/kg, safety and long cycling stability). It is demonstrated that electrode compositions of active inorganic/organic materials – conductive carbon (with various forms such as carbon black, carbon nanotubes and graphene) are necessary for the large-scale application of rechargeable batteries in the areas of electric vehicles and smart grids.

Keywords: Carbon composites, Inorganic oxides, Organic carbonyl salts, Rechargeable Li/Na batteries