

A new approach to the preparation of high capacity  
conversion electrodes

Craig A. Bridges,<sup>†,\*</sup> Zhonghe Bi,<sup>†</sup> Raymond R. Unocic,<sup>‡</sup>  
Gabriel Veith,<sup>‡</sup> M. Parans Paranthaman,<sup>†</sup>

<sup>†</sup>Chemical Sciences Division, Oak Ridge National  
Laboratory, Oak Ridge, Tennessee 37831, USA

<sup>‡</sup>Materials Science and Technology Division, Oak Ridge  
National Laboratory, Oak Ridge, Tennessee 37831, USA

There is a critical need for improved electrical energy storage in terms of capacity, voltage, recharge time, safety and cost for a renewable energy grid, practical electric vehicle technology, and future portable energy technology. One approach under consideration to overcome current limitations in lithium ion batteries is to utilize a multielectron conversion electrode.<sup>1</sup> A major challenge for the development of conversion cathodes for Li-ion batteries is to understand how to improve rate capability and simultaneously access a large reversible capacity, due to problems with irreversibility and poor conductivity. We present here a new approach to the preparation of oxide and non-oxide electrodes involving conversion reactions with lithium. The electrode microstructure and the composition of the anion sublattice will be discussed in consideration of their impact on the capacity and cycling stability.

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<sup>1</sup> Gao, X.-P.; Yang, H.-X.; "Multielectron reaction materials for high energy density batteries", *Energy Environ. Sci.* **3** (2010) 174-189.