Single Particles Cathode Material Electrochemical Properties From Micro-Pipets Methods.

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Lithium ion batteries have demonstrated their importance in portable electronics and as alternative to fossil based portable energy in automotive applications.[1] This importance is expected to continue at least in the near and intermediated future. However, in the longer term electrode materials will need improved capacity and charge/discharge rates. As new anode and cathode materials are developed[2] they are typically screened for advantageous properties by assembly into a working battery. This typically involves film fabrication from a mixture of conductive material (*e.g.* carbon), a binder (*e.g.* polyvinylidene fluoride), and the active material of interest. How this film is cast onto the current collector, the ratio of the individual components of the film, the drying procedure for the film and the final assembly of the cell can significantly alter the performance of the battery.[3,4] In order to avoid misleading information about the effectiveness of a novel active material many cells are required to validate findings.

Here we present micro-pipet measurements[5,6] which demonstrate the suitability of the technique for probing lithium ion battery materials. Specifically, we probed dispersions of active materials to determine the oxidation and reduction potentials, and the charge capacity of the material. Data obtained on candidate materials by the micro-pipet method was compared to coin cell measurements, to critically assess this technique for characterization of active battery materials.

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