

DIFFUSION COEFFICIENT MEASUREMENT METHOD FOR Li-ION ANODE MATERIALS

Rajasekhar Tripuraneni, Subhajit Rakshit, Siva Nadimpalli

Department of Mechanical and Industrial Engineering, New Jersey Institute of Technology,

Newark NJ 07102, nadimpal@njit.edu

Potentiostatic intermittent titration technique (PITT) and Galvanostatic intermittent titration technique (GITT) are currently most widely used measuring techniques for diffusion coefficients of Li^+ in both high energy density anode materials and various cathode materials for lithium ion batteries. The standard GITT and PITT techniques do not consider the effect of stress in the measurement process. However, it was previously shown that the stresses generated in high energy density electrodes during lithiation/delithiation will affect the diffusion of lithium in electrodes which in turn could affect the diffusion coefficient measurements. Hence, in this study thin film electrodes were used to show how the high stresses generated could affect the diffusion coefficient measurements. The merits and demerits of GITT and PITT will be discussed and a slightly improved method for diffusion coefficient measurement will be discussed.

Key Words: *Li-ion battery, high energy density, diffusion, stress, GITT and PITT*