

The Effects Of Internal Pressure Evolution On The  
Ageing Of Commercial Li-Ion Cells

Anthony Matasso

The University of Texas at Arlington  
416 Yates Street, 537 Nedderman Hall  
Arlington, Texas 76019

Over the past decade, the market for rechargeable lithium ion batteries has significantly grown to match the demands of consumer and commercial customers. Applications which require large storage capacity, high C charge and discharge rates, and long term cycling such as electric and hybrid electric vehicles are of particular interest. Due to the long calendar and cycle life requirements for these applications, it is necessary to understand the ageing process of the batteries and their state of health. Electrochemical impedance spectroscopy (EIS) has become one preferred method for nondestructive evaluation aimed at understanding the fundamental ageing processes of li-ion batteries. While promising, it is still unclear how reliable this method will be and if it will be viable for use at the module level or only at the cell level making in-situ battery analysis challenging. While research should continue in the investigations of using EIS measurements, alternative methods for evaluating in-situ battery ageing must also be pursued in order to provide the customer a safe reliable product. This paper discusses the influence of electrolyte decomposition, the changes this causes in the internal cell pressure and the correlation of the bulk cell pressure to the ageing of the battery.