

Symp B02

커패시터와 연결된 Li/SOCl₂ 하이브리드형 전지의 전기분석 Electrical Analysis of Li/SOCl₂ Hybrid Cell Connected with Capacitor

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A Li/SOCl₂ cell is an attractive primary battery with high specific energy, long shelf life, and a relatively long operating life. Practical uses for this cell is as power sources in applications that require long operating life such as automatic meter reading(AMR) system etc. Typically, the electrical consumption of such systems includes a sustained low background current of several microamperes and intermittent current pulses with amplitudes of several tens to several hundreds of milliamperes and a duration of milliseconds.

Unfortunately, during storage under open-circuit conditions or under low background currents the lithium anode of the Li/SOCl₂ battery is passivated by a film that substantially reduces the operating voltage of the battery. As a result, during high current pulses, the cell voltage drops to a low level. This voltage-drop problem can be partially overcome by adding an organic compound such as polyvinyl chloride, or an inorganic compound such as SO₂, to the cell solution for modifying the passive film the increase its conductivity. Such additives do not, however, completely solve the passivation problem.

Recently, connection of the battery in parallel with an electrochemical capacitors or secondary batteries has been suggested to be beneficial for high-current pulse applications. There are, however, very few reported investigations of the electrical characteristics of the system in detail. Accordingly, this presentation examines the electrical characteristics of a Li/SOCl₂ hybrid cell connected to a capacitor by using impedance method. Particular attention is paid to using the capacitor as means to suppress the voltage delay.